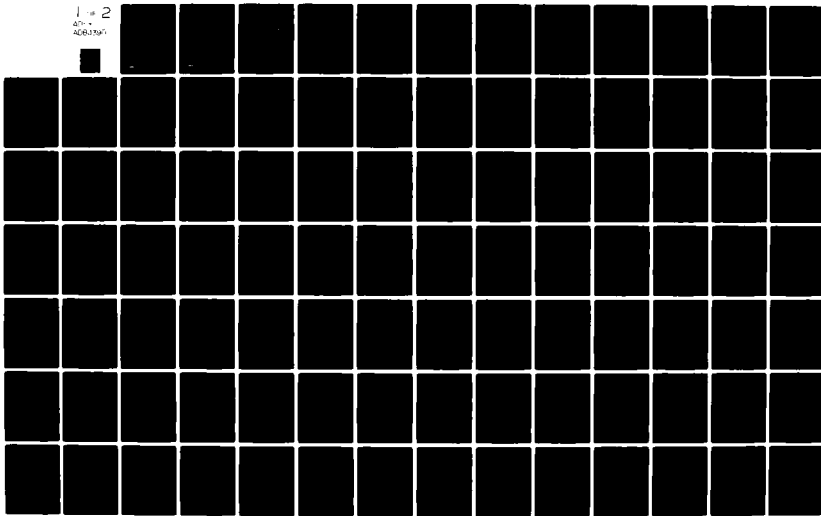


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**SURVIVAL, RECONSTITUTION AND
RECOVERY: U.S.-SOVIET ASYMMETRIES
AND U.S. POLICY OPTIONS**

Final

February 1980

Technical Note
SSC-TN-7933-1

By: Richard B. Foster
Francis P. Hoeber (Consultant)

Prepared for:

Federal Emergency Management Agency
Washington, D.C. 20472

Contract DCPA01-78-C-0308
W.U. 4341C

SRI Project 7933

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Richard B. Foster, Director
Strategic Studies Center**

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to what can be done, and preparations to assure the ability of a surviving and caring government to communicate to the people during the first phases of a nuclear war about what is being done and what needs to be done; (4) all civil planning must be done in close coordination with the planning of military doctrine, forces and C³; (5) it also became clear in the study that Survival and Reconstitution are pre-conditions for Recovery and must be studied and planned for before consideration of Recovery is relevant.



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EXECUTIVE SUMMARY

A. Definitions

Civil defense--and civil emergency preparedness (CD/CEP)--is often perceived as primarily an attempt to save lives and sometimes also to save economic assets in order to assure recovery from nuclear war. This report will use a much broader definition and interpretation of civil defense and of its purposes and utility. An earlier SRI study has emphasized the political utility of civil defense as an element in deterrence and potential diplomatic coercion.¹ For the sake of clarity, the key concepts used herein are defined at the outset, as summarized in Figure A.

B. Conceptual Asymmetries

Considering U.S. policy options and their possible utilities, we note first the basic U.S.-Soviet asymmetries in historical and current concepts of deterrence. The United States perceives the necessity for deterring nuclear war as overriding and therefore sees preparations for surviving and even winning a nuclear war as essentially irrelevant. The Soviets, in contrast, see the necessity of a capability for both surviving and, if possible, prevailing in a nuclear war as both a precondition of deterrence and as a hedge

¹

Richard B. Foster and Francis P. Hoerber, et al, "The Politico-Military Utility of Soviet CD/CEP Strategic Defense Systems and Their Significance for U.S. Nuclear Targeting Policy," SSC-TN-7536-1, SRI International for Defense Nuclear Agency (May 1979). See also Francis P. Hoerber, "Civil Emergency Preparedness if Deterrence Fails," Comparative Strategy, Vol. 1, No. 3, pp. 183-199.

1. *Survival and Reconstitution*

- Not just physical.
- Must include social cohesion and political purpose.
- Must include means of control and termination of war.
- Preconditions of recovery.

2. *Continuity of Government (COG)*

- COG is the essential precondition for achieving survival and reconstitution.
- COG embodies defense of constitution and political values, and continuity of same.
- Must include President as commander in chief and head of state and chief executive.
- Must include clear presidential successor survival system to ensure legitimacy.
- Reconstitute Congress and Supreme Court (could afford delay) to ensure eventual return to full constitutional government.
- Must extend to state and local levels (the higher the level of war damage, the more important leadership and control in "islands" may be).

3. *CD/CEP*

Civil defense and civil emergency preparedness include all pre-war, trans-war and postwar nonmilitary preparations—plans, programs, mobilization—for survival, reconstitution and recovery

4. *Recovery*

- Even after achievement of survival and reconstitution, the meaning of recovery is not clear.
- Neither aggregate nor per capita GNP at some prewar level appears to be a satisfactory measure.
- The composition of the GNP will change drastically.
- The war, or an uncertain truce, may be long.
- The criteria for recovery must therefore include the capability to maintain sufficient power to ensure the security of the nation in the postwar world.
- Recovery must be political, social and military, as well as economic.

Figure A DEFINITIONS OF KEY CONCEPTS

against failure of deterrence. If the Soviets can convince both the United States and its allies that it has acquired these capabilities, escalation control will pass to them, and diplomatic or military coercion at lower levels of conflict will become feasible. Thus, CD/CEP would be an essential component of a war-surviving, war-winning capability that had positive political utility for the Soviets.

This asymmetry in view of the usefulness of preparedness stems from a more basic difference in beliefs about nuclear war. Figure B attempts both to reflect, in a simplified manner, the basic differences and to dramatize the potential impact of translating these attitudinal differences into policy. The ordinate in Figure B is a notional measure of effective damage to a nation not in quantitative physical terms but rather in terms of the ability of the nation to survive nuclear war as a political and economic entity. The abscissa is a notional measure of the size, or weight, of the nuclear attack, without specifying the precise measure (e.g., number of warheads, megatonnage, equivalent megatonnage, etc.). The upper curve represents what we might call the apocalyptic view, that the effect of a relatively small nuclear attack (perhaps tons or hundreds of weapons, hundreds of megatons, or, say, a few cities destroyed) would shock and disrupt the political, social, and economic fabric of the country so severely that it would cease to survive as a national entity. This is the philosophy that appears to have dominated U.S. policy since the 1960s, at least until very recently.

The lower line, in contrast, represents a view that we believe dominates Soviet planning: that nuclear war would indeed be devastating and is to be avoided if possible, but, with sensible preparation and careful conduct, could be survived, prosecuted, and won. The rapid rise of the line at the right to convergence with the upper line simply recognizes, as the Soviets have acknowledged, that there is some level of attack which would indeed destroy a nation, in particular because excessive levels of contamination and fallout would prevent the successful carrying out of prepared survival measures. Within this conceptual

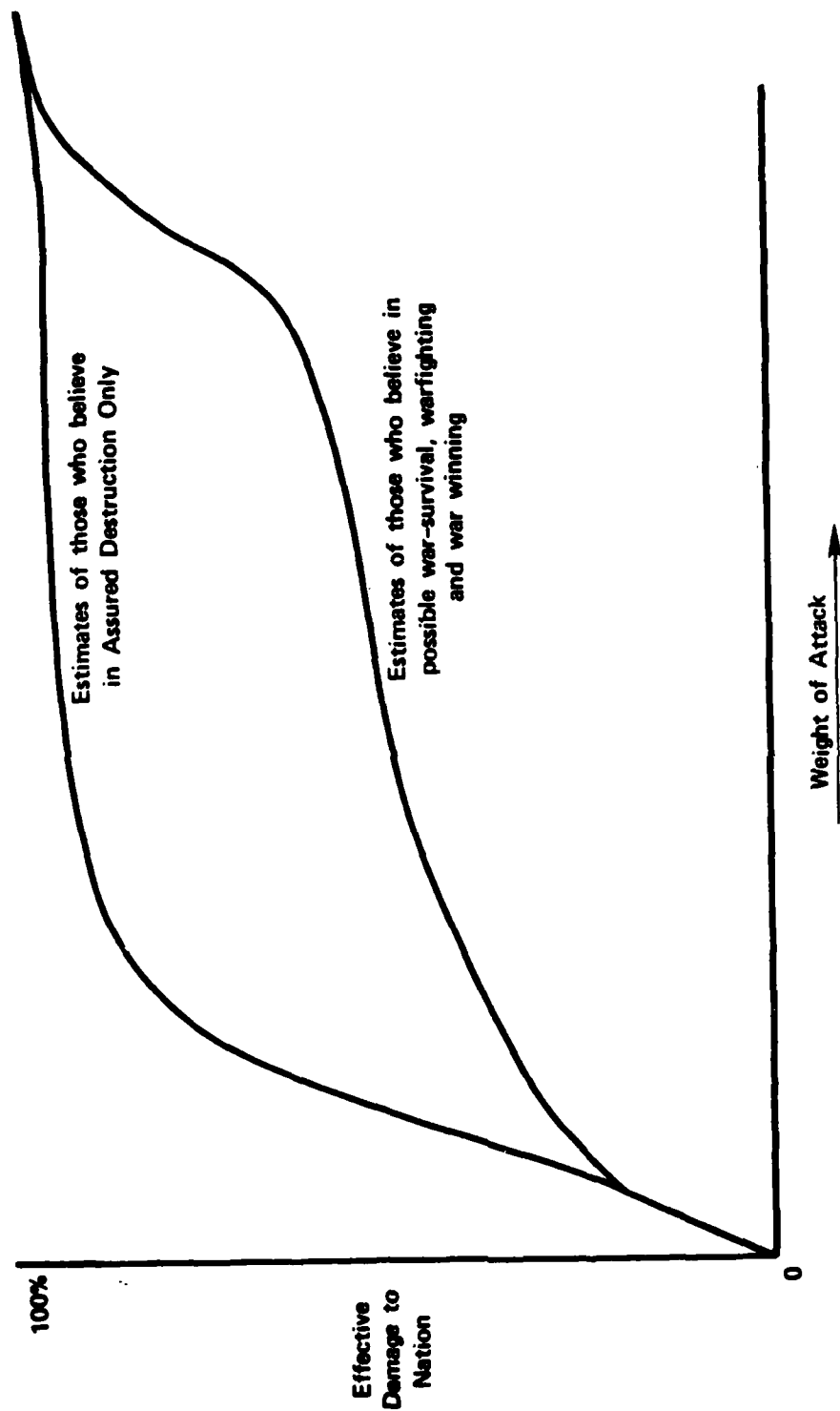


Figure B EFFECT OF BELIEFS ON ESTIMATES OF NUCLEAR WAR OUTCOMES

framework, attempts to limit the weight of the enemy's feasible attack through diplomatic means (e.g., SALT limitations) or through military damage limitation by means of counterforce capabilities will tend to move outcomes to the left on the lower line. Similarly, CD/CEP preparations, including mobilization, and heroic war-time efforts to carry out such planning tend to push the lower line downward, limiting effective damage to the nation.

C. Soviet CD/CEP

The Soviet CD/CEP programs seem to be based on the views reflected in the lower line of Figure B. As expressed by the Director of Central Intelligence, the Soviet Civil Defense Program has three primary goals:¹

1. To protect the Soviet communist party/military/government infrastructures and people, in the following priorities:
 - a. Leadership, the top down to local levels
 - b. The essential work force
 - c. The remainder of the population;
2. To protect the physical sources of economic productivity, and to plan and train for the continuity of essential economic activities in wartime and to facilitate the restoration of production after nuclear attack;
3. To sustain the surviving population in the period immediately following a nuclear attack (the survival phase) and to prepare (reconstitute) for longer-term post-attack recovery.

¹

DCI, "Soviet Civil Defense," NI78-10003 (July 1978). For a more comprehensive analysis of the role of civil defense and related measures in overall Soviet strategy, see Richard B. Foster, "The Soviet Concept of National Entity Survival," SSC-TN-7176-1, SRI International for OASD, International Security Affairs (March 1978).

D. The Strategic Framework

The above attitudinal asymmetries between the Soviet Union and the United States constrain the strategic framework within which we can currently evaluate U.S. policy options. Figure C summarizes this framework. The upper right quadrant represents the U.S. mutual assured destruction concept, under which there can be no win in a large-scale nuclear conflict. The upper left quadrant reflects the Soviet objective of a Soviet win through high potential or actual damage to the United States and damage-limitation in the Soviet homeland, to enhance both deterrence and the prospects of Soviet victory if deterrence fails. In the lower left quadrant, which could encompass limited nuclear conflicts, the potential victory may be indeterminate, but perceived Soviet strategic nuclear superiority in the 1980s may in fact provide the potential for a Soviet win in this quadrant, in terms of limited gains, or U.S. acceptance of Soviet faits accomplis, e.g., in the Mid-East or Europe. Clearly, the lower right quadrant, the potential locus of a U.S. win, is a null set, since victory is not a U.S. objective.

E. The Importance of Considering All Levels of Conflict

That Soviet strategic superiority in all probability will be reached, and will be perceivable, in the early 1980s is established in Chapter III of the report. Any consideration of the overall strategic nuclear balance, as in Chapter III, must of course contemplate the extremes, if all or most of the forces in being should be brought to bear in the event of the failure of deterrence and escalation control. Whatever the truth of the belief that escalation control is impossible in a period of "rough" parity, or "equivalence," we must reckon with the possibility that escalation control will prove possible in a period of Soviet superiority (as it apparently was in the period of U.S. nuclear dominance). This study has attempted, therefore, to consider a wide spectrum of possible

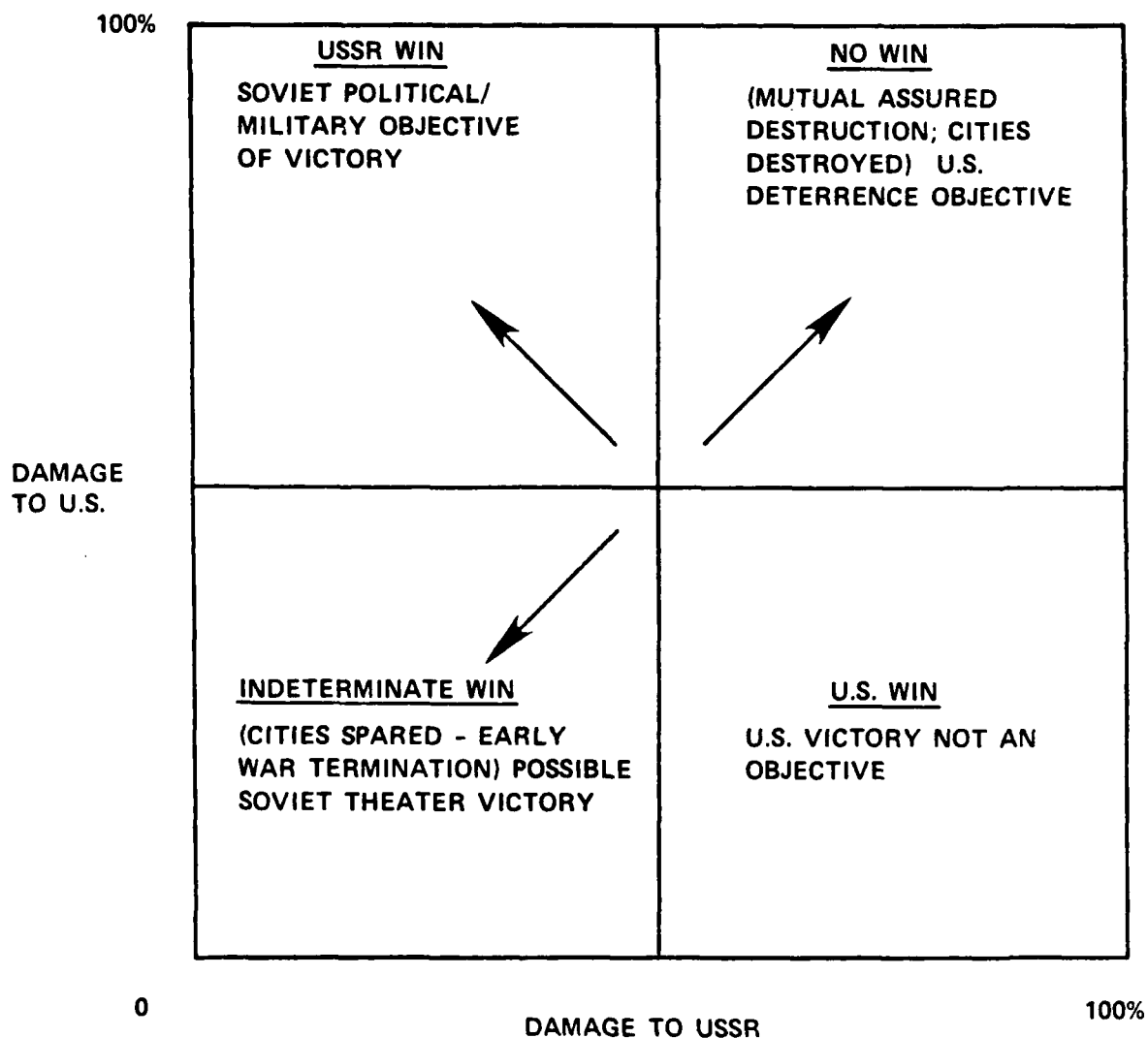
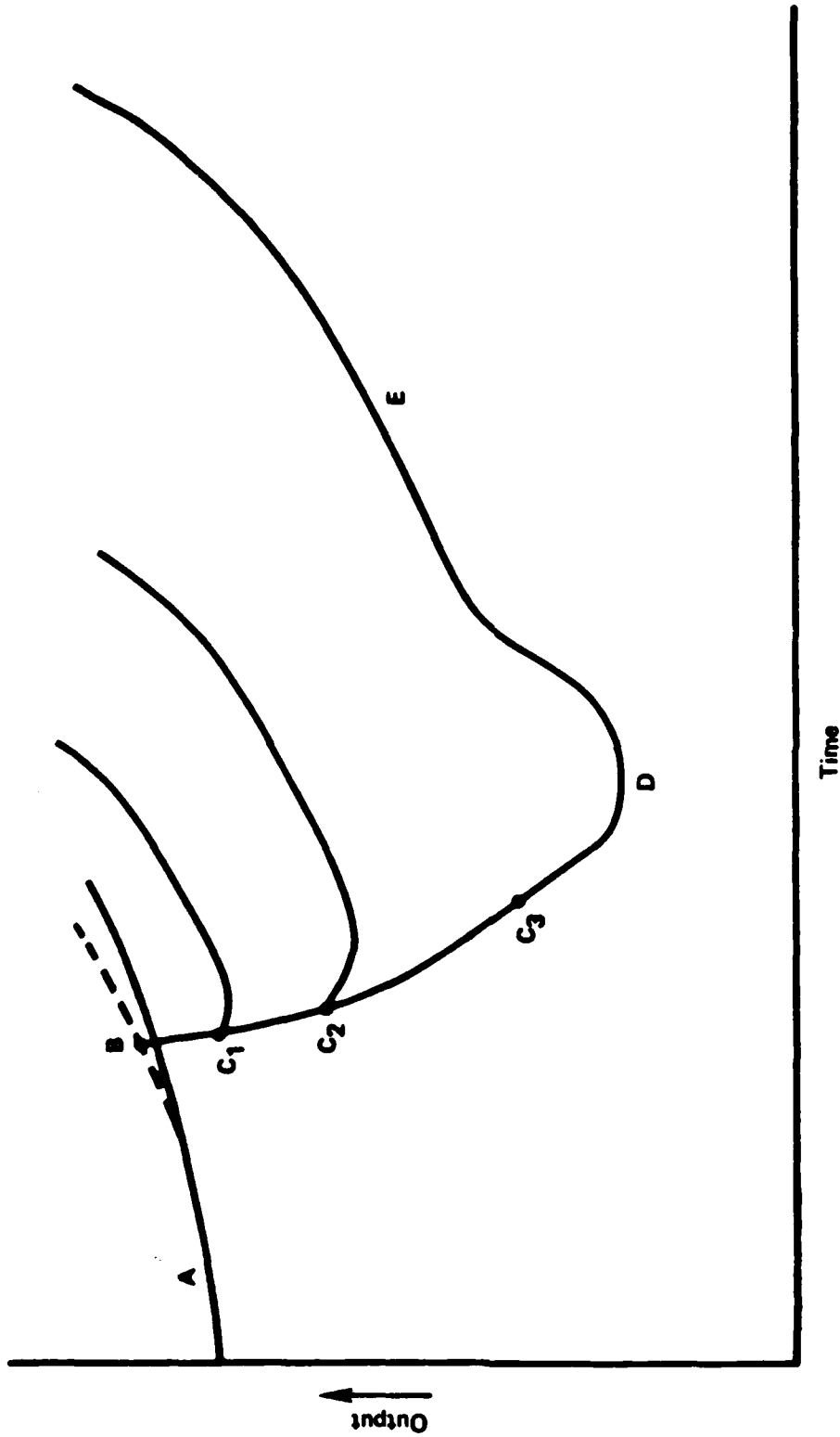


Figure C VECTORS OF POTENTIAL OUTCOMES OF U.S./USSR
STRATEGIC NUCLEAR EXCHANGES

conflicts and to postulate and evaluate U.S. policies to meet the threat and to offset the Soviet CD/CEP component of its force posture at all levels. Worst case analysis, establishing program requirements that are potentially politically infeasible and which might indeed fail in a truly all-out "worst case" attack, must not be permitted to preclude the development of options and programs of potential high utility at lower levels of conflict.

Three examples of interest points on the spectrum of nuclear conflict are shown in Figure D. Here the ordinate is a notional concept of an overall measure of output (e.g., GNP) and the abscissa is time. The first segment of the curve, A, is simply the normal, pre-crisis growth curve of one economy or the other. The dashed segment, B, represents possible mobilization of resources in time of crisis. The C_s represent alternative points of termination of the (nuclear) war. At C_1 , we have a short war, terminated after a limited counterforce attack, with the reduction in output being the result of collateral damage only and economic recovery being virtually assured, unless precluded by the terms of the war termination. C_2 indicates a longer war, with counterforce plus defense industry, ports, and other military targets attacked. Damage is considerably heavier, but again, survival and recovery are probably assumable, subject to the above caveat. At point C_3 we have a long war, with "all-out" political, economic, and military targeting. Output will take a dip quite beyond that enforced by the actual level of damage to productive assets, as people are preoccupied with the struggle to survive and reconstitute their government, society, and economy. D, then, represents the periods of survival and reconstitution. The study reviewed the literature and assessed the current state of the art of recovery analysis, which shows that successful completion of the survival and reconstitution phases is almost universally assumed before recovery is analyzed. Our own findings, in contrast, are that recovery, E, is a function of D (which is in turn a function of CD/CEP as well as of military preparedness) and also of the post-attack balance of military powers and alliances.

STAGES OF NUCLEAR WAR



A = peacetime economy

B = mobilized economy

C = alternative war termination points

C₁ = Short war: counterforce and collateral damage only

C₂ = Longer war: CF plus defense industry, ports, other military

C₃ = Long war: all-out political, economic and military targeting

D = survival and reconstitution

E = recovery

Figure D THE MEASUREMENT PROBLEM: EVALUATING THE ECONOMICS OF SOVIET CIVIL DEFENSE

F. Three Philosophies of Survival and Reconstitution

We have seen above that, if the nuclear phase of war is terminated at an early stage, the damage may be likened to that of a natural disaster and Recovery can be treated as a problem to be managed, rather than a question of feasibility. There may, however, be an ongoing theater and oceanic war, and therefore local Survival and Recuperation must be managed within a mobilized wartime economy in which Recovery in the peacetime sense is postponed. Unfortunately, we cannot know in advance whether the nuclear war will terminate at this early point. National planning must therefore encompass points C_1 , C_2 , and C_3 (or the broad spectrum of possibilities that these three points were arbitrarily selected to represent). A deterrence-only philosophy, however, treats nuclear war as a disaster, or "natural event," and makes no serious preparation for such an event which might "get out of hand" and reach point C_3 . Such a posture--the present posture of the United States--involves the protection of military C^3 , but without providing it with endurance. It involves a minor and potentially ineffective continuity of government (COG) program, little preparation for war mobilization, and limited capability for war termination efforts. (See Figure E). It is not a viable approach. Lack of intent and preparation to survive may be a self-fulfilling prophecy.

An increased level of concern (say, associated with an expectation of attack C_2) might be termed the Military-Planning-Only philosophy. To the preparations under the Disaster philosophy it would add Endurance for military C^3 and some mobilization and war termination capabilities. The third alternative philosophy would be that of National Entity Survival. Such a philosophy requires the addition of a serious and enduring COG protection program, to ensure civilian control of the military at all times, war-fighting and war-termination capabilities at all levels of attack, and eventual reconstitution of the constitutional government and the national entity as it had been known before the war. It would also require a large and effective CD/CEP program.

PHILOSOPHY	METHOD	OUTCOMES AND OBJECTIVES
<p>A. DISASTER, OR "NATURAL EVENT" Deterrence only: military C³ protected but no endurance; Little COG protection. Little war mobilization capability - or only USSR has it</p>		
<p>B. MILITARY PLANNING ONLY Add: endurance to military C³, some war mobilization and termination capability</p>		
<p>C. NATIONAL ENTITY SURVIVAL Add: COG protection and endurance with civilian control of military at all times; war fighting and termination capability at all levels of attack; CD/CEP</p>		

Figure E THREE PHILOSOPHIES OF PREPARATION FOR
SURVIVAL AND RECONSTITUTION PHASES
BETWEEN INITIAL ATTACK AND RECOVERY

The blank columns for Method and Outcomes are filled in after the discussion of options, below.

G. U.S. Options

It has been argued in the past that Soviet civil defenses, to the extent that they are effective, can be overcome by changes in U.S. targeting. Flexible targeting options, like the interaction of active and passive defenses with offensive forces, clearly increase uncertainty for the enemy--today an additional asymmetry in favor of the Soviet Union. As illustrated in Figure F, however, flexibility in targeting is not in itself sufficient. The Soviet policy of maintaining large reserve forces, counterforce capabilities, CD/CEP, and air defenses have greatly increased U.S. uncertainties and Soviet options. To similarly increase U.S. options and Soviet uncertainties will require increased and secure U.S. reserve forces, counterforce capabilities, CD/CEP, and air defenses. The Department of Defense Annual Report for FY 1981 indicates movement in the direction of increased secure reserve forces.

The effects of varying the relative emphasis on four targeting options (population, recovery, political control, and military power) are shown in Figure G. The phrase, "relative emphasis," is used advisedly, since no case was found in which pure targeting of one of the above categories was either feasible or preferred. As shown at the bottom of the chart, under each targeting emphasis, Soviet CD/CEP programs impact heavily on U.S. requirements. This finding carries the clear implication that serious U.S. CD/CEP programs would have great impact on Soviet requirements.

If population is defended and is no longer an easy target, or a low cost option for the attacker, then the targeting emphasis for nuclear deterrence (and for "victory" in nuclear war) will shift to other target systems. Ultimately, the basic target priorities of both the United States

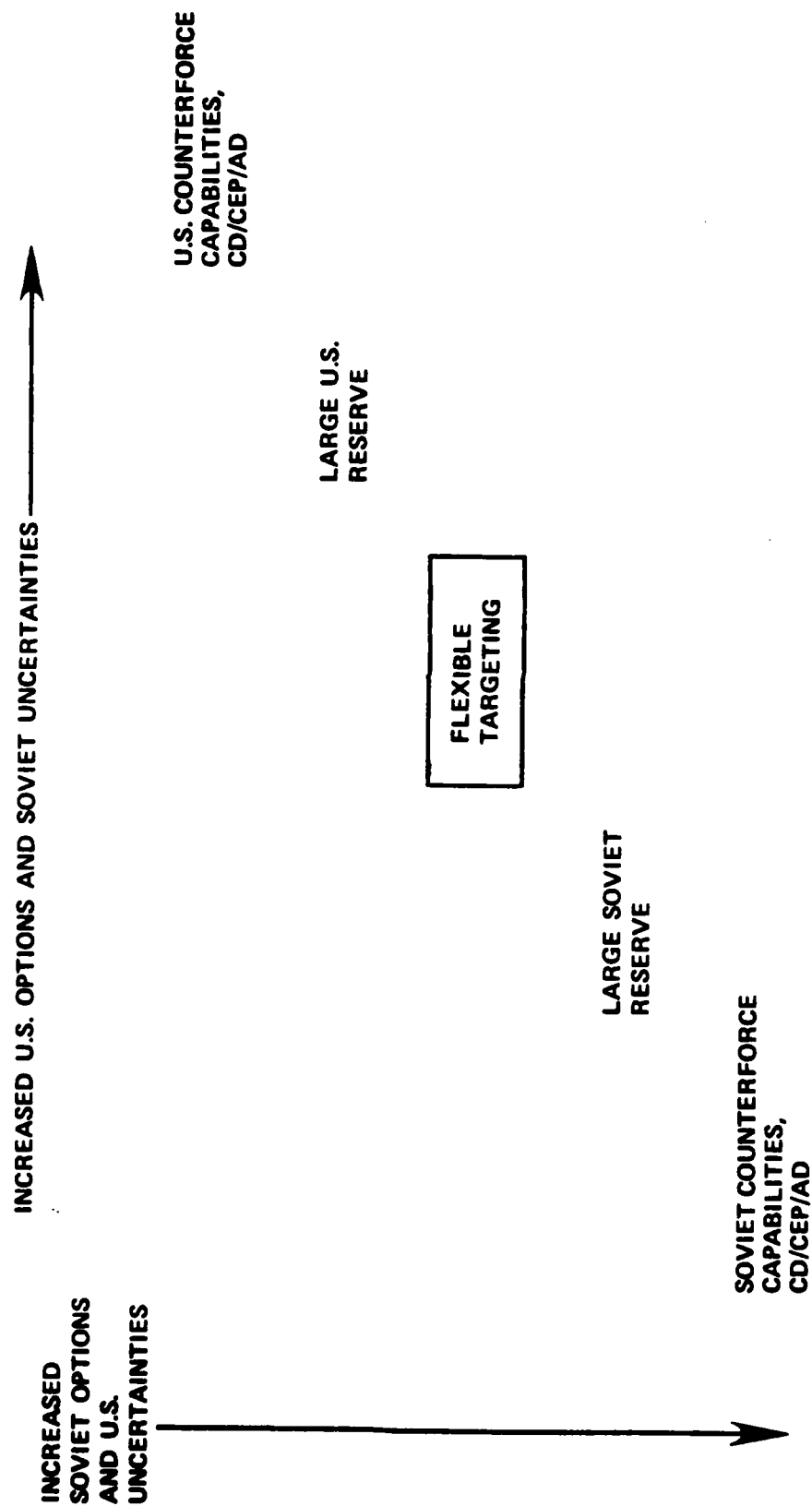


Figure F IMPACT OF ADDING OPTIONS ON OPPONENT'S UNCERTAINTY OF OUTCOME



EFFECT ON: 		EMPHASIS ON: 			
		POPULATION	RECOVERY	POLITICAL CONTROL	MILITARY POWER
POPULATION		ASSURED DESTRUCTION OF NATION	COLLATERAL	COLLATERAL	COLLATERAL
RECOVERY		SIGNIFICANT	DENY NATIONAL RECOVERY	SELECTIVE	SELECTIVE (MILITARY SUPPORT ONLY)
POLITICAL CONTROL		?	?	DESTROY CENTRAL POLITICAL CONTROL OVER SOVIET REPUBLICS	?
MILITARY POWER		STRATEGIC NUCLEAR TARGETS	WEAKENS LONG TERM SUPPORT	DESTROY MILITARY C ² AND MAJOR WEAPONS AND FORCE CONCENTRATIONS	DEFEAT SOVIET STRATEGIC AND THEATER NUCLEAR AND CONVENTIONAL FORCES
EFFECT OF SOVIET CD/ CEP ON U.S. REQUIREMENTS		MORE OFFENSIVE FORCE, BUT SOVIET CD DEFEATS U.S. OBJECTIVE	MORE WEAPONS, LARGER AND MORE ENDURING STRATEGIC RESERVE FORCE (SRF) AND C ³ , BUT CD WEAKENS	PROBABLY THE SAME AS MILITARY POWER REQUIREMENTS, BUT BETTER INTELLIGENCE NEEDED	INCREASED NUMBERS, ACCURACY, FLEXIBILITY OF WEAPONS: C ³ WITH ENDURANCE; SUPPORT OF ALLIED FORCES TO PREVENT SOVIET VICTORY IN THEATERS

Figure G IMPLICATIONS OF SOVIET CD/CEP FOR ALTERNATIVE EMPHASES IN U.S. NUCLEAR TARGETING POLICY
(OBJECTIVES FOR EACH OPTION EMPHASIZED)

and the Soviet Union would be political-military, and not the civilian population and economy. Thus, a U.S. CD/CEP program could radically affect not only the outcome of a nuclear exchange, but also Soviet confidence in achieving a highly asymmetrical outcome. In short, U.S. CD/CEP programs, in combination with active defenses, counterforce capabilities, an enduring secure reserve force (and C³I), and a rethought targeting doctrine (with required intelligence and weapons capabilities), could contribute to the reinforcement of U.S. deterrence and escalation control.

H. Requirements of the Three Philosophies for Survival and Reconstitution

We are ready now to fill in, on Figure H, the spaces left blank in Figure E. We see in Section A of Figure H that treating nuclear war as a disaster, or natural event, requires minimum preplanning and no attention to the problems raised above, but, unless the nuclear war is terminated at a sharply limited point, contributes nothing to the expectations or improvement of war outcomes. Moreover, the only objective is the unrealistic hope of survival and recovery, with no real postwar aims.

In Section B of this Figure, military planning-only requires enduring military C³ and some war mobilization, but still prepares solely for a short and limited war. It risks the outcome of permanent military control, with no political aims and objectives for the limited war-fighting that does take place.

A national entity survival philosophy adds important requirements for civilian planning for the continuity of government and CD/CEP. It also requires emphasis on mobilization planning, including allocations that take account of postwar military objectives, and it emphasizes the requirements for civilian control of (1) the military conduct of the war, (2) negotiations with the enemy for war termination and with allies for alliance cohesion, and (3) management of the nation during the trans-attack, survival, and reconstitution phases. This approach offers the

PHILOSOPHY	METHOD	OUTCOMES AND OBJECTIVES
A. DISASTER, OR "NATURAL EVENT" Deterrence only: military C ³ protected but no endurance; Little COG protection. Little war mobilization capability - or only USSR has it	Minimum Preplanning Conventional war mobilization only Military command-control nonenduring Ad hoc survival period Military may seek to reconstitute government No war fighting--chaos	Outcomes War over? Clean up the mess? No more enemies? Postwar objectives (not realistic) Domestic - survive, recover Int'l - none, except recover at faster rate than USSR
B. MILITARY PLANNING ONLY Add: endurance to military C ³ , some war mobilization and termination capability	Add: Improved, enduring military C ³ War mobilization, including some stockpiling, etc. Military management of survival period Some short-term war fighting	Outcomes Permanent military control? If war fighting, to what political ends? Postwar objectives: same as A but more realistic
C. NATIONAL ENTITY SURVIVAL Add: COG protection and endurance with civilian control of military at all times; war fighting and termination capability at all levels of attack; CD/CEP pre-war, trans-war, postwar.	Add: Civilian COG planning CD/CEP Mobilization planning and economic allocations to postwar military objectives Civilian control of military for survival aid, war fighting, escalation control, war termination	Outcomes Survival, reconstitution, recovery, postwar power all possible; postwar political ends possible Postwar objectives Domestic: survive, reconstitute constitutional democracy, recover socially, politically, and economically Int'l: a national security position, with allies and access to world's resources and markets, in an international system based on free nations.

Figure H THREE PHILOSOPHIES OF PREPARATION FOR SURVIVAL AND RECONSTITUTION PHASES BETWEEN INITIAL ATTACK AND RECOVERY

possibility of survival, reconstitution, recovery, and an adequate post-war power position. The postwar objectives are important and consonant with the fact of risking/fighting a war, including: domestically, to survive, preserve a constitutional democracy, and recover socially, politically, and economically; and internationally, to achieve a national security position with allies and with access to world resources in markets in an international system of free nations.

I. Conclusions

In sum, then, the principal findings of this study are:

1. CD/CEP must be based on a philosophy of national entity survival;
2. Planning cannot guarantee success in worst cases, but failure to plan can guarantee failure and can mean foregoing benefits at lower levels of conflict, including the "zero" stage that we call deterrence;
3. A principal role of defenses in general, and CD/CEP in particular, is to increase enemy uncertainties and limit his targeting options and capabilities;
4. CD/CEP should not be evaluated in vacuo but rather by taking account of the complementarity of active defenses, passive defenses, offensive forces, and targeting doctrine;
5. The establishment of enduring command, control, and communications (C³) capabilities is vital both for the continuity of government and for the restructuring of government for the conduct of a long war (Office of Defense Resources, etc.);
6. Recovery is a dependent variable--a function of planning, mobilization, defenses, survival, reconstitution, and the post-exchange balance of power and alliances;
7. The evolution of U.S. strategy and targeting doctrine must take account of the above points.

ABSTRACT

This report summarizes a year of study for DCPA/FEMA on the potential contribution of civil defense and emergency preparedness to Survival, Reconstitution and Recovery in the event of nuclear war. Principal findings include: (1) the Soviets believe that a nuclear war can be survived, and they therefore plan and prepare to attempt to assure survival and recovery; (2) the widespread belief in this country that any nuclear war will produce a shock that destroys national cohesion and will may be self-fulfilling if no steps are taken to prepare to survive; (3) preparation must start with the education of the American people as to what can be done, and preparations to assure the ability of a surviving and caring government to communicate to the people during the first phases of a nuclear war about what is being done and what needs to be done; (4) all civil planning must be done in close coordination with the planning of military doctrine, forces and C³; (5) it also became clear in the study that Survival and Reconstitution are pre-conditions for Recovery and must be studied and planned for before consideration of Recovery is relevant.

DISCLAIMER

The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either express or implied, of the Federal Emergency Management Agency or the United States Government.

CONTRACTUAL NOTE

This Technical Note is in fulfillment of Contract DCPA01-78-C-0308.

FOREWORD

This final report on SRI Project Number 7933 examines the relation between civil defense and civil emergency preparedness and the potential for Survival, Reconstitution and Recovery after a nuclear war. At the request of the client, first emphasis was placed on analysis of the strategic framework of the pre-war, trans-war, and post-war environments in which this planning, Survival, Reconstitution and Recovery might occur. In so doing, the study benefited greatly from close coordination with OJCS/SAGA/COPRA, in connection with which the authors participated in a number of seminars and conducted two seminars. The study drew heavily on two reports on Soviet civil defense--"The Soviet Concept of National Entity Survival"(SSC-TN-7167-1) and "The Politico-Military Utility of Soviet CD/CEP Strategic Defense Systems and Their Significance For U.S. Nuclear Targeting Policy"(SSC-TN-7536-1). It is also benefited greatly from close liaison and cooperation with George Divine, of DCPA/FEMA, and from a workshop conducted in August 1979 to evaluate the approach and principal findings before the draft of the final report.

Richard B. Foster
Senior Director
Strategic Studies Center

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I INTRODUCTION

A. Background

As has often been pointed out, attempts to measure recovery from nuclear attack have in the past suffered from several serious limitations. First, most studies have assumed an all-out nuclear exchange--the worst case for analysis--and have ignored lesser attack levels and limited targeting objectives. Moreover, the all-out nuclear attacks (often defined by mirror-imaging U.S. Assured Destruction or Assured Retaliation attacks on urban-industrial complexes or economic, political and military targets, respectively) are postulated as though they took place in a vacuum and in a single instant, rather than in the more realistic terms of the possibility of a continuum: nonnuclear conflict; phased, or incremental, theater/strategic nuclear exchanges; and concomitant and possibly protracted conventional conflict, including war at sea.

Second, recovery models have generally assumed that the country has somehow survived the immediate effects of nuclear attack, has succeeded in reorganizing itself and reconstituting its government and institutions and has recuperated sufficiently to be ready to restart normal economic activities. The models may, then, be said to assume away the really tough questions of the great unknown experience of nuclear war and to have directed themselves to what appear to be more manageable problems of measuring surviving assets, rates of substitution (of capital for labor, of materials, and so on) and the effects of alternative allocation policies.¹

¹ Howard M. Berger, "A Critical Review of Studies of Survival and Recovery After a Large-Scale Nuclear Attack," R&D Associates, RDA-TR-107006-009, for the Defense Nuclear Agency (December 1978).

Primary attention in this paper will therefore be given to the periods preceding economic recovery, i.e., the spectrum from peacetime posture through crisis and warfare to Survival and Reconstitution. On this broad front, we will consider the asymmetries between the United States and the Soviet Union in philosophies, goals and objectives, forces and doctrine, and CD/CEP (civil defense/civil emergency preparedness--defined below) in their potential role in crisis control, intrawar deterrence (escalation control), and damage limiting at various levels of conflict. In considering U.S. policy options for the balancing of asymmetries, attention will be given to alternative targeting doctrines and capabilities as well as CD/CEP options per se.

B. Key Definitions

1. Survival

The initial phase after the first nuclear strike (recognizing that there may be only one or two strikes but that there may also be many "phases" or "staged" attacks) is generally called the Survival phase. In the first minutes, hours, and perhaps days, this may be a local matter: determining what happened, putting out fires, succoring the wounded, including the added horror of triage choices; burying the dead; securing food and water; determining radiation levels, shelter-time and decontamination requirements; establishing communications; restoring utilities; and maintaining public health and preventing epidemics. But there will also be the psychological factors of preventing panic and anomie, and maintaining morale. These may be functions of pre-attack education and postattack communications, information, leadership, the establishment of hope, and the assignment of responsibilities. Hence the problem does not remain purely local, and the overlap with the Reconstitution phase, including Continuity of Government (COG), may be critical. The Survival phase must include National Entity Survival (social and political), not just the immediate physical requirements.

2. Reconstitution

The most important aspects of Reconstitution are national in scope and include the programs for Continuity of Government at not only the Federal but also the State and local levels. Reconstitution is the transition from the Survival phase to the initiation of Recovery, i.e., living off inventories to the point where economic activity can be restored and production can equal or exceed inventory consumption. Reconstitution also includes the restoration of essential institutions--a medium of exchange, the rule of law, etc.

3. Recovery

Given the above definition of the initiation of Recovery, it is much harder to define the achievement of Recovery. No simple economic criteria are adequate. The nature and composition of the economy will for a long time be drastically changed by the pattern of damage suffered, the possibility of a long war or the threat of renewed war, the necessity for temporary government controls (possibly long-term) and allocations. Since Recovery, too, must be seen in terms of political and social National Entity Survival, not just economic survival and recovery, the purposes of government controls and allocations will be to ensure social and political recovery and provision for the maintenance of national security, assuring the nation's independence and sovereignty, power, and providing support for the capability of protecting alliances.

4. CD/CEP

As currently defined in the United States, the term civil defense (CD) refers to the passive protection of population and property, and, to the extent that it limits the damage caused by a military attack, it can constitute a vital element in a nation's defense system--fulfilling a unique role in terms of the Survival and Recovery of a nation which cannot be filled by active defenses and offensive forces and systems.

The concept of passive defense, however, embraces far more than a simple CD, and for that reason, the term "civil emergency preparedness" (CEP) is considered more accurate.¹ It encompasses--as does the term Civil Defense in the Soviet Union--all the non-military preparedness capabilities of a nation for resource management (which has significant consequences for military and industrial mobilization), as well as for the protection of vital national assets--not only population and property, but governmental, military, and economic leaders and functions. Obviously, to the extent that such preparatory measures fulfill their intended functions, they have a direct relationship to national security. By protecting population (including the labor force and general pool of military manpower), industry, and political, military, and economic leaders, an adequate preparedness capability limits the amount of damage a potential adversary could inflict, and enables rational retaliation and the post-attack functioning of the nation, including its capability to mobilize militarily. This has obvious consequences for deterrence of attack, as well as management of international crises. In the interest of precision, we use the admittedly cumbersome term "CD/CEP" to describe the total nonmilitary passive defense system of a nation.

5. Continuity of Government (COG)

A key element of CD/CEP and basic requirement for National Entity Survival is the preservation of those personnel and physical assets required to ensure the continuity of the Federal Government. This is the linchpin for the preservation of our national values and objectives--saving not only people and assets but also the essence of our social, political and ethical system. Without this goal, there is no reason for fighting. If we don't care about the conditions under which we live, even if they are

¹ Passive defense includes military as well as civil protective measures, e.g., hardening of silos or dispersal of forces. In this study, however, we are concerned only with civil aspects of passive defense.

those of, say, a foreign or domestic totalitarian state, then "better Red than dead" is a valid basis for strategy, and a strategy of preemptive surrender is a preferable alternative to war and a presumably effective way to prevent nuclear attack.

If we do believe in preserving our form of government and society, then we must take steps to assure continuity of government in the event of attack. War can be prosecuted only with the maintenance of enduring military C³, starting with the National Command Authorities (NCA). Without stopping to evaluate whether even this limited objective is today achievable, we are interested here in the reasons for setting a much more stringent objective: provision for the continuity of civilian government--provision for the legitimacy and functioning of the President, not only as Commander in Chief, but also as Head of State and Chief Executive. If this can be accomplished, and Survival, Reconstitution and Recovery prove achievable, then it may also be possible to have a society that can achieve or look forward to the ultimate termination of wartime measures under the War Powers Act, martial law, etc.; we can then return to our constitutional, democratic determination of leadership succession and to enjoyment of our ethical way of life, however long return to our pre-war physical way of life may take--in short, National Entity Survival.¹

Provision for the Continuity of Government is already legally mandated, and the primary responsibilities for its implementation lie with the Federal Emergency Management Agency (FEMA). The most important legislation is that of the Law of Succession, which supplements the Constitutional provision for a President and Vice President with some 15 other successors, starting with the Speaker of the House, the President Pro Tem of the Senate and then running through the Cabinet, from the Secretary of State and Secretary of Defense, down to the Secretaries

¹ For an elaboration of this concept, see R. B. Foster, "The Soviet Concept of National Entity Survival," SSC-TN-7167-1, SRI International for OASD/International Security Affairs (March 1968).

of Transportation and Energy. Current provisions for the implementation of this requirement in nuclear war, under the scenarios considered here, are inadequate. For the present, it suffices to indicate that the most important implication is the requirement to maintain a system, compatible with whatever physical arrangements are made for the protection of successors (e.g., by dispersal and/or sheltering), rapidly to determine the highest-ranking surviving successor. It is essential to the success of the program that the legitimacy of the new President be established with high reliability. We need only note in support of this proposition that the law provides that if a successor is sworn in and then a higher ranking successor is found indeed to have survived but to have been out of communication, he cannot retrieve the office from the sworn successor.

The requirements for meaningful continuity of government are, however, far more complex than just the reliable identification of the legitimate successor. He, and therefore all others in the line of succession, must be provided with some minimum staff to be effective, plus security and other support personnel for that staff, plus data bases and computer facilities as well as communications required to carry out their respective advisory and/or delegated responsibilities. In time, it will also be necessary to reconstitute the Congress and the Supreme Court, which are essential to the legitimization of the subsequent acts of the successor President. The Court is likely to be dispersed and can be reconstituted by Presidential appointment and Senatorial consent. The Congress may be dispersed--it can only be recessed by its own action. (See below.)

There are three major roles for the wartime President, with tasks in each role that may be summarized as follows:

- The Commander in Chief, or the Secretary of Defense as his delegated alternative NCA (National Command Authority), must:

- Order or withhold U.S. nuclear strikes;
 - Maintain control and direction of withheld strategic forces, the Secure Reserve Force (SRF);
 - Control and direct use of theater nuclear forces and general purpose forces, including tactical nuclear forces;
 - Direct continued intelligence, including assessment of damage in the USSR and elsewhere; and,
 - Assess damage in the United States and direct the necessary use of military forces for the maintenance of internal order or the protection of borders, if required.
- As Head of State, the President must be able to:
 - Maintain direct or indirect communications with any heads of state (Soviet Union, other Warsaw Pact nations, ...), with the objectives of escalation control and war termination on acceptable terms; and,
 - Communicate with U.S. allies, to coordinate prosecution of the war, maintain alliance cohesion, and consult on war termination moves and terms.
 - As Chief Executive, the President must communicate directly or through subordinates, as rapidly and continuously as feasible, with the surviving population on:
 - The identity and legitimacy of the successor and the state of the national government;
 - The state of the war, of the alliance, and of war and termination plans;
 - The will of the government and the expression of its leadership for the purpose of sustaining the morale of the populace;
 - Information as to when and how measures are being or will be taken to assist the people to survive and recuperate;
 - Coordination with surviving State and local governments and, as time progresses, other institutions, of necessary priorities for communications, allocations of the materials and facilities for production essential to prosecution of the war and defense against remaining contingencies (remembering that the war may be protracted, and that determination of the durability of any truces may be uncertain for considerable periods); and

- Propagation of possible declaration of martial law and other actions taken for the management of the emergency.¹

C. Congress and the Supreme Court

It was noted above that in the long run the legitimacy and continuity of the Federal Government depends not only on the legitimacy of the Presidency but also on the survival/reconstitution of a legitimate Congress and Supreme Court.

- Congress: The President will need the Congress for two major purposes:
 - To confirm appointments. An appointed Vice President must be confirmed by a majority vote in both houses. New cabinet members and Supreme Court justices must be confirmed by two-thirds of the Senate. The House and Senate, respectively, can replace the first two legal successors, the Speaker of the House and the President Pro Tem of the Senate.
 - To provide new legislative authority and appropriations for actions that may be required, and in some cases approval after the fact, or nondisapproval within specified times for emergency actions.

The second of these functions is not time-urgent in terms of a two-week period. The first might be. Survival of a quorum of the Congress is unpredictable. The Congress is likely to be sitting in a crisis period. The President can call the Congress into session but, as noted above, he cannot adjourn it. Whether the Congress would disperse itself in crisis would be up to each house and/or to individual members.

Under the 17th Amendment, the Senate can be reconstituted by gubernatorial interim appointment of Senators, if the

¹ While martial law is not U.S. policy, neither is nuclear war, but both may occur. Note that under Department of the Army Regulations (32 C.F.R. 501.4) "...the decision to impose martial law may be made by the local commander on the spot, if the circumstances demand immediate action, and time and available communications facilities do not permit obtaining approval from higher authority (§ 501.2)."

legislatures of the respective States have so empowered the executive. (The survival and successor problems of the States are beyond the scope of this study.) Representatives, however, must be elected. Special elections can be called in the States, but obviously this is a longer-term proposition.

- Supreme Court

- The principal wartime and postwar function of the Supreme Court, apart from its normal function of handing down decisions on cases brought to it on appeal, would be rendering decisions on the Constitutionality of emergency actions by the President and emergency legislation by the Congress. This function does not appear to be time-urgent during a nuclear war. As for survival of the Court, dispersal is, as with the Congress, a matter for the Court itself and/or individual members. If dispersed, the Court can render emergency decisions by polling--if adequate communications are available for this polling and for satisfying the Justices' own demands for information and consultation on any cases brought to it.
- Reconstitution of the Court would be by Presidential appointment and Senate confirmation.

D. The Search for Criteria

Before proceeding with the analysis, certain cautions should be noted.

1. The generalized objective for the U.S. to recover economically at a faster rate than the USSR cannot be measured directly, if at all, and is an inadequate criterion.

2. All survivability criteria depend on the design of the war: the USSR has the initiative and a growing "credible first-strike capability," and he who starts the war in this case is in a better position to terminate it on favorable terms.

3. As a corollary, the objectives of the U.S. deterrent posture and of SALT--that there be no advantage to either side in striking first--appear to be fading fast.

4. There is no clear political/social objective in our strategic lexicon for either U.S. "national entity survival" or for maintaining a forward U.S. world posture after the war is over.

5. The question of "How much CD/CEP is enough?" cannot be answered now because of (1) the required prior decision on what kind of CD/CEP and (2) indeterminate but potentially fundamental differences between U.S. and Soviet capabilities to recover politically and socially from attacks on cities. What weight of attack will kill a city? Lessons learned from the World War II U.S. Strategic Bombing Survey of Germany and Japan have not been applied, including, for example, the need to maintain central (national) political control and communications at all times as a pre-condition of economic viability.

E. The State of the Art of Recovery Analysis

There is a large literature on recovery from nuclear war, and a considerable number of computer models of recovery have been developed. An excellent annotated bibliography has recently been compiled for FEMA.¹ This literature tends to bear out the observations of John Stuart Mill in 1848:

[The] perpetual consumption and reproduction of capital affords the explanation of what has so often excited wonder, the great rapidity with which countries recover from a state of devastation; the disappearance, in a short time, of all traces of mischief done by earthquakes, floods, hurricanes, and the ravages of war. An enemy lays waste a country by fire and sword, and destroys or carries away nearly all the moveable wealth existing in it; all the inhabitants are ruined, and yet in a few years after,

¹

Abe Feinberg, "Civil Preparedness and Post-Attack US-Economic Recovery: A State of the Art Assessment and Selected Annotated Bibliography," Analytical Assessments Corporation, Marina del Rey, CA, AAC-TR-9204/79 (October 1979).

everything is much as it was before. This vis medicatrix naturae has been a subject of sterile astonishment, or has been cited to exemplify the wonderful strength of the principle of saving, which can repair such enormous losses in so brief an interval. There is nothing at all wonderful in the matter. What the enemy has destroyed, would have been destroyed in a little time by the inhabitants themselves; the wealth which they so rapidly reproduce, would have needed to be reproduced and would have been reproduced in any case, and probably in as short a time. Nothing is changed, except that during the reproduction they have not now the advantage of consuming what had been produced previously. The possibility of a rapid repair of their disasters mainly depends on whether the country has been depopulated. If its effective population have not been extirpated at the time, and are not starved afterwards; then, with the same skill and knowledge which they had before, with their land and its permanent improvements undestroyed, and the more durable buildings probably unimpaired, or only partially injured, they have nearly all their requisites for their former amount of production. If there is much of food left to them, or of valuables to buy food, as enables them by any amount of provocation to remain alive and in working condition, they will in a short time have raised as great a produce, and acquired collectively as great wealth and as great a capital as before; by the mere continuance of that ordinary amount of exertion which they are accustomed to apply in their occupations.¹

One amendment is appropriate to make this 1848 quote applicable in the 1980s. In the mid-nineteenth century, probably 80-90 percent of the value of plant and equipment was on the average in the plant or building, the remainder being equipment. By the turn of the century, the ratio was about 70:30. In 1950, the ratio had been reversed to roughly 30:70. Today, the mid-1800s figure is probably reversed.²

¹ John Stuart Mill, Principles of Political Economy, 1848, cited by Feinberg (ibid.), p. 1-1, from the 5th London edition of Principles of Political Economy (New York: D. Appleton and Company, 1920, Vol. I), pp. 108-109.

² The 70:30 and 30:70 figures come from a study by F.P. Hoerber at the Defense Production Agency, circa 1951. The report is no longer available.

The point is that, where Mill referred to "the more durable buildings probably unimpaired," we must consider today that modern "curtain wall" and other light industrial structures might be blown down by 2-5 psi overpressures from a nuclear detonation; but much of the valuable equipment now housed in these light structures is much harder machinery, some of which will survive (especially if its hardness is enhanced by protective measures). With this exception, Mill might have been writing today.

The problem is, however, we cannot know if the literature and the models are applicable. The studies generally make assumptions about Mill's condition that people, food for them, and some of their assets survive. Such assumptions are a legitimate step in the analytical process, but more questionable is the assumption, usually implicit, that the Survival and Reconstitution Phases of the post-attack period have been successfully negotiated. If these periods can be gotten through, then recovery is almost foreordained. Indeed, the rate of recovery is often underestimated, since most models tend grossly to understate a number of factors: changed demand patterns, for both government and private consumers, and the rate of substitution and adoption of other conservation measures. On the other hand, the models may with equal probability underestimate or overestimate recovery by ignoring the potentially controlling exogenous variable of the post-war balance of power, as well as the pattern of alliances. They simply ignore such questions as: Will the Soviets have the power to coerce aid from contiguous Europe, Northeast Asia, or Southeast Asia? Can they interdict U.S. imports? It is often forgotten that after WW II, surviving power—that of the United States and the Soviet Union—determined the rates and perhaps the facts of recovery in Europe and Japan. The effects of different policies were most readily observed in West and East Germany, where there was a vast difference in the rates of recovery, and even to this day in the levels achieved in those two countries. Indeed, they were well advertised by the Soviets in the late 1940s and the 1950s, as they taught a punitive "lesson" (until the population movement westward through the Berlin gap in the "Green Border" compelled the election of the Berlin Wall and a reversal of Soviet policy).

Feinberg¹ traces the inadequacy of the input-output models that dominated recovery modeling until sometime around 1970 and also of the simulations of the 1970s that were forced to rely heavily on input-output data.

Feinberg concludes that system dynamics offers the greatest promise of successfully incorporating modeling of the Survival and Reconstitution periods along with Recovery, but the authors of the present report have seen no evidence to date that this methodology has been able to do anything more than chain assumptions about individual and institutional behavioral patterns in these periods. Nor have the authors found any evidence that the widespread criticisms of the work of Jay Forrester, the originator of System Dynamics, have been adequately met. Feinberg himself notes the failure of Forrester's Urban Dynamics and World Dynamics models. We conclude, therefore, that until the Survival and Reconstitution phases are far better understood, and adequate means are found for including this understanding in models of post-war activity, the modeling of Recovery will remain irrelevant to the assessment of nuclear war outcomes. (See Appendix A).

This is not to say that such models cannot be useful in comparing and evaluating alternative CD/CEP measures, and perhaps even in the more academic exercise (except as it might affect pre-war planning) of comparing alternative post-war policies.

¹ Op. cit.

II THE ROOTS OF ASYMMETRY

A. Basic Beliefs

There are many reasons for the observable asymmetries in U.S. and Soviet doctrines and force postures (including passive defense and CD/CEP), to be found in history, geopolitics, politics, ideology, and economics. These have been explored elsewhere.¹ For our present focus on asymmetries in CD/CEP, and options available to the United States, it is useful to give particular attention to the asymmetry in beliefs about nuclear war.

In the United States, there is a wide spectrum of views on nuclear weapons and nuclear wars, but there tends to be polarization, that is, a clustering of views at or near the two ends of the spectrum: (1) a conviction that nuclear warheads are weapons of total destruction, the use of which, once started, could not possibly be limited or controlled and would make survival of nuclear conflict impossible and the concepts of fighting and winning irrelevant--this might be called the left end of the spectrum; (2) the polar view, on the right end of the spectrum, that a nuclear revolution has occurred but that the basic laws of warfare are unchanged--the risks are now far greater, and caution is in order for statesmen, but escalation control is conceivable. Survival may be possible, and defense, rather than being hopeless and therefore

¹ Richard B. Foster, "The Soviet Concept of National Entity Survival," SSC-TN-7167-1, SRI International for OASD/International Security Affairs, (March 1978), and Richard B. Foster, William M. Carpenter, Jane E. Nicklin, William Perry and Francis P. Hoeber (Consultant), "The Politico-Military Utility of Soviet CD/CEP Strategic Defense Systems and Their Significance for U.S. Nuclear Targeting Policy," SSC-TN-7536-1, SRI International for Defense Nuclear Agency (May 1979).

irrelevant, may play a role in deterrence and may help a nation to Survive and Recover if deterrence fails.¹

Strategic interactions between the United States and the Soviet Union reflect the basic divergence between the two nations in their concepts of the use of nuclear force, stemming from geopolitical, political, and historical causes.

The United States emphasizes deterrence-only, through the threat of retaliation to nuclear attack--heretofore retaliation primarily against city-located targets and therefore against population. With a deterrence-only goal, there is no role for defenses, including civil defense; there is a fear that deployment of defenses could negate the assumed two-sided goal of Mutual Assured Destruction (MAD) and imply a first-strike threat; the addition of strategic defenses is considered to be not only destabilizing but costly, resulting in exacerbation of the arms race; and there is a belief that enemy defenses, especially civil defense, are futile and can be easily overcome.

The Soviet Union, in contrast, abjures a distinction between war-fighting and deterrence. While nuclear war is to be avoided if possible, a war-fighting capability is considered the most effective deterrent, and if nuclear war should come, then survival and winning is the national

¹ For extensive discussions of the relationships of individuals' views on nuclear war, the inevitability of escalation, the possibility of survival and recovery, and preferred U.S. doctrine, see Comparative Strategy, Vol. 1, No. 3, Editor's Introduction by R. B. Foster, and Vol. 1, No. 4, "Ideology and Economic Analysis: The Case of Soviet Civil Defense," by R. B. Foster and F. P. Hoerber; and also, R. B. Foster, F. P. Hoerber, et al., "The Politico-Military Utility of Soviet CD/CEP Strategic Defense Systems and Their Significance for U.S. Nuclear Targeting Policy," SSC-TN-7536-1, SRI International for Defense Nuclear Agency (May 1979).

goal (and, in fact, the attempt is regarded as a patriotic obligation of officials, the military, and civilians). In this light, defense is essential and is an organic part of survival and war-fighting capabilities. Maintenance of these capabilities has high political-military utility, permitting Soviet freedom of action in the international arena and diplomatic coercion when and where this freedom is threatened or challenged.

Clearly, Soviet policy is dominated by the "right" view of nuclear war as feasible, survivable, and winnable--hence the very extensive and intensive Soviet civil defense program, along with their emphasis on offensive arms with war-fighting capabilities. Equally clearly, while U.S. opinion is highly diversified, the U.S. policy appears for many years to have been dominated by the view from the left, which has led to a negligible CD/CEP program and to emphasis in the offensive forces on retaliatory capability, not on war-fighting (counterforce) capabilities. The SALT II debate, raging as this is being written, may be the catalyst for reconsideration of war-fighting capabilities.¹ It may also have an influence on CD/CEP programs. Studies such as the current one must proceed from the position that the view from the right may be correct, as otherwise there would be nothing to evaluate.

In short, the utility of CD/CEP in nuclear is in the eye of the beholder. Figure 1 shows this in a schematic way. The ordinate is a notional measure of effective damage to a nation in terms of its ability to survive as a political and economic entity. The abscissa is the weight of the attack, whether measured in numbers of delivered warheads, megatonnage, equivalent megatonnage, or some other proxy variable for all factors entering into the infliction of effective damage. One hundred percent effective damage does not necessarily mean total physical

¹ As this goes to press, the Iranian crisis and the Soviet invasion of Afghanistan are the obvious triggers.

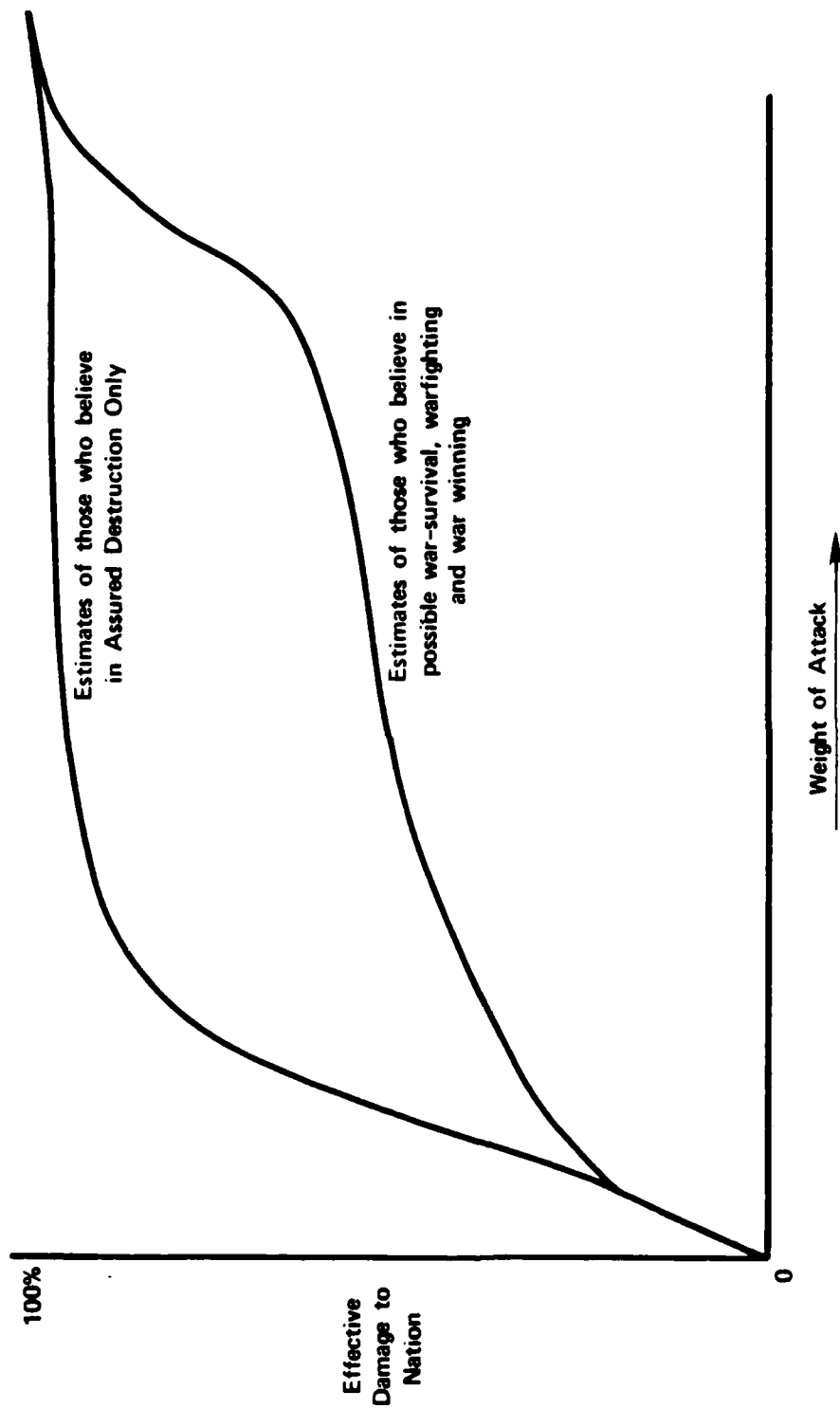


Figure 1 EFFECT OF BELIEFS ON ESTIMATES OF NUCLEAR WAR OUTCOMES

destruction but rather the point at which the social system itself is destroyed, a Hobbesian world results, and society cannot maintain its government, its values, or the capability of independent Survival and Reconstitution. In effect, the National Entity is destroyed.

The first, or left, school would draw the upper curve. Even small nuclear attacks will have devastating effects (and therefore their threat will deter). The line rises rapidly to the point of virtually complete damage--destruction of the National Entity, prevention of Survival, making the living envy the dead, etc. From there on little is to be gained by the application of additional force--only "overkill" or "bouncing the rubble." The measurement problem in this case is confined to that of determining how few weapons are required for deterrence. Past estimates of those who believe in "minimum" or "finite" deterrence have ranged from one-to-ten weapons up to 400 megatons.

The lower line would be drawn by those on the right of the spectrum, a minority of U.S. policy makers in past years but the policy makers in the Soviet Union in those (and presumably future) years. The first one or two weapons might have similar effects to those projected by the first group (in outcome, but not in deterrence), but then the line rises far less steeply. Defenses, planning, discipline, and morale can play a role in survival, even in war winning and recovery. It is only to the far right of the graph that the curve starts to rise toward 100 percent effective damage. Even the Soviets agree that there is some very high number of weapons or megatons that would achieve this result.

The measurement problem on the lower line concerns how much is needed, not to reach the point of inflection or takeoff toward total destruction, but to do sufficient damage to prevent enemy control of the postwar situation, to impose on him an unfavorable relative outcome, and/or to induce war termination on acceptable terms, somewhere between the first detonation and the exhaustion of one or both arsenals. In addition, one wishes to measure (which one does not on the upper curve)

the changes brought about by capabilities for counterforce damage limiting (e.g., yield/accuracy combinations), active and passive defenses, planning, and so on.

Defenses, in effect, can move the steeply rising part of the lower curve to the right; put another way, they can reduce the effective weight of attack. If, as in current SALT agreements, the numbers of offensive forces are fixed, so that the possible weight of attack has a cutoff, defenses can be tailored to the known maximum attack and the curve can be moved downward by the defender, limiting the feasible level of damage.

The great uncertainties of a possible future war, and the importance of the viewpoint brought to its appraisal, should not be permitted, however, to preclude drawing certain minimum deductions. First, the basic purpose of defenses, if they cannot be impregnable, is to create uncertainty for the offense. Unopposed, an offensive that has not been deterred by the threat of counterattack can be supposed to be certain of success. Defenses can impair that certainty. If they introduce sufficient uncertainty, they can be expected to deter. Second, it is the Soviet view that, if deterrence fails, defenses will have some damage-limiting effect. If one believes that truth lies anywhere below the top line in Figure 1, one must concur with the Soviets in principle, though one may differ on matters of extent.

This simplified model of the effects of differing viewpoints has obscured qualitative differences in the kinds of attacks at different points on the abscissa, which measures only quantitative differences. This will be analyzed below, but first the next section will consider the effects of these asymmetrical beliefs, and the policies deriving from them, on the potential outcomes of U.S.-Soviet strategic nuclear exchange.

B. Possible Outcomes of Nuclear Confrontation/Conflict

In Figure 2, the potential relative outcomes of U.S.-Soviet nuclear wars are represented in terms of notional scales of damage to each country, as on the ordinate of Figure 1. The U.S. objective is to be found in the vector in the upper-right hand quadrant, where damage to each side would be so nearly total as to mean No Win for either side--a mutual hostage situation, Oppenheimer's "two Scorpions in a bottle," a state of "mutually assured destruction"--as on the upper curve in Figure 1. The upper-left vector reflects the Soviet objective of a Soviet Win, through high actual or potential damage to the United States and damage limitation in the Soviet homeland.

An Indeterminate Win situation might emerge in the lower-left quadrant, if limited exchanges could be terminated at the low damage levels on each side. Soviet strategic superiority could, however, give them the possibility of a win in terms of limited gains (e.g., U.S. acceptance of some Soviet fait accompli, such as the conquest of Germany or of Europe), because of the threat to drive the conflict toward the upper-left corner. In short, the nation with the preponderance of force at the "highest level," i.e., strategic nuclear superiority, is the one that controls escalation.

There is no vector shown in the lower-right, U.S. Win quadrant. Such an outcome is not at present possible: it is not a U.S. planning objective because of a prevailing belief that such a goal is unattainable and in addition is "dangerously provocative."

In sum, this map of possible results of U.S.-Soviet nuclear conflict contains no vectors leading to a favorable outcome for the United States and, in fact, no standoff or stalemate outcome, given the contrast in both the objectives and the military postures of the two powers. Several specific aspects of the interactions can be identified, with actual and potential asymmetries that are predictable from the above mentioned summarized analysis.

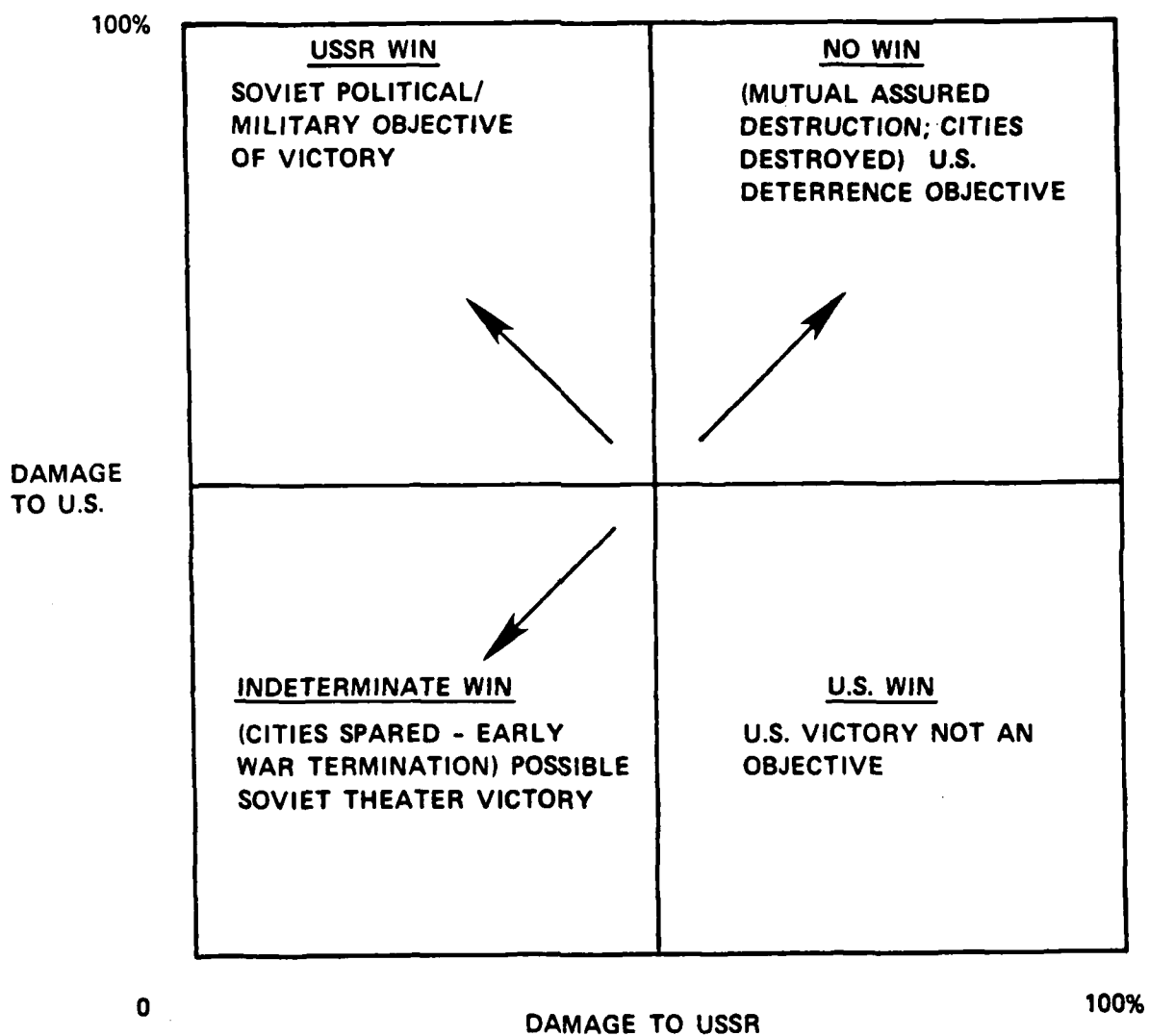


Figure 2 VECTORS OF POTENTIAL OUTCOMES OF U.S./USSR
STRATEGIC NUCLEAR EXCHANGES

1. Parity and Superiority

When the United States possessed a clear strategic nuclear superiority, it tolerated--and rationalized as desirable--the evolution of parity. It was officially predicted that the Soviets would accept, or stop at, parity, and the United States has sought to codify the concept and the state of parity in SALT. But to the Soviets, parity is the stage of transition from inferiority to superiority, the latter, as we have seen, being viewed by the Soviets as usable in diplomacy and necessary in war.

2. Stability

Parity, in U.S. eyes, could be a basis for strategic stability, if the technical conditions could be established to prevent either side from gaining superiority by striking first. (One definition of parity is thus a balance such that either side could absorb a first strike and still retaliate with "unacceptable damage", i.e., "assured destruction".) To the Soviets, however, parity is essentially destabilizing--war is possible or likely only between relatively equal protagonists. The type of superpower strategic stability the Soviets seek is one in which strategic superiority--a favorable "correlation of forces" and a (Soviet) favorable war outcome estimated by both the United States and the USSR--permits regional destabilization wherever the Soviets perceive potential advantages from gains of revolutionary socialist forces at the expense of status quo capitalist powers.

3. Strategic Defenses

The above U.S. concept of stability through mutually assured destruction means not only no requirement for strategic defenses but the actual undesirability thereof, since, if actually or apparently effective, such defenses could negate parity and assured destruction, and thus destroy stability. To the Soviets, as noted above, defenses are an essential

part of a credible deterrent; they are also an essential part of the effort to save the nation if deterrence fails. The result has been: (1) the creation of vast, nationwide Soviet air defenses vs. token U.S. defenses for the "control of the sovereign airspace"; (2) the negation of a decisive U.S. technological lead in ballistic missile defense by the ABM Treaty and the subsequent development of Soviet ABM technology to create a potential for decisive breakout from the Treaty some time in the 1980s; and (3) the development of a comprehensive Soviet civil defense program against negligible civil defense programs in the United States. To this list of disparities might be added the heavy emphasis of the Soviets on the passive defense of their far larger land and air general purpose forces, an antisatellite capability not yet possessed by the United States, and far greater damage-limiting counterforce capabilities.

The Soviets may not have such high confidence in these defenses as to be tempted to launch a surprise attack on the United States, and thus the defenses may not have significant political utility in peacetime periods of low tension. In deep crisis confrontation, however, these capabilities may make the Soviet leadership willing to take greater risks with regard to nuclear war than would the leadership of the United States, with negligible strategic defenses and impending inferiority in strategic offensive forces. It is, therefore, only through the study of such strategic political factors--supplementing the calculations of war outcomes, based on limited tactical cost-effectiveness analysis, that are standard in the U.S. defense community--that the political-military utility of Soviet civil defenses and recovery planning, and of U.S. countering options, can be evaluated.

4. Allied Political Will

The question of the strength of will of allied as well as U.S. leadership in times of U.S.-Soviet confrontation is also critical, because extended deterrence of Soviet attack on our allies as well as on the United States is a major purpose of our deterrent forces and a linchpin

to our associated nonproliferation policy. Yet, if the great asymmetry in U.S. and Soviet defenses, especially civil defenses, leads our allies to believe that the Soviet resolve will be greater than U.S. resolve, can we expect our allies to stick with us? Will they not be sorely tempted to make their own accommodations with the Soviets rather than to depend on a United States they believe likely to succumb to Soviet nuclear diplomatic coercion? Moreover, if our allies perceive approaching Soviet strategic nuclear superiority--even marginal superiority--and an increasing Soviet propensity to test U.S. will in crises short of all-out war, may not this perception tend to weaken the alliance cohesion well in advance of any deep crisis or showdown? Talk of Ostpolitik and Finlandization is increasingly heard in Europe, and talk of the possible need for its own nuclear deterrent--or an accommodation to the USSR--is no longer an unmentionable subject in Japan.

C. Stages of Escalation

But if we are to evaluate U.S. policy options that might open up some vectors in the empty southeast quadrant of Figure 2, and specifically, if we are to consider CD/CEP policy options to operate on the lower curve of Figure 1, it is important to note the differences in kinds of wars that might occur at different levels of attack. Figure 3 reflects, conceptually, some representative cases and suggests some possible stopping points on the escalatory ladder.

The first segment, A, of the curve in Figure 3 reflects the pre-nuclear-conflict trend of the economy of one side (measured in GNP, output, or some overall measure of the level of economic activity). The dashed segment, B, represents possible mobilization in time of crisis. In the Soviet case, there is a significant degree of mobilization in the peacetime segment A--the current official estimate that the Soviet

STAGES OF NUCLEAR WAR

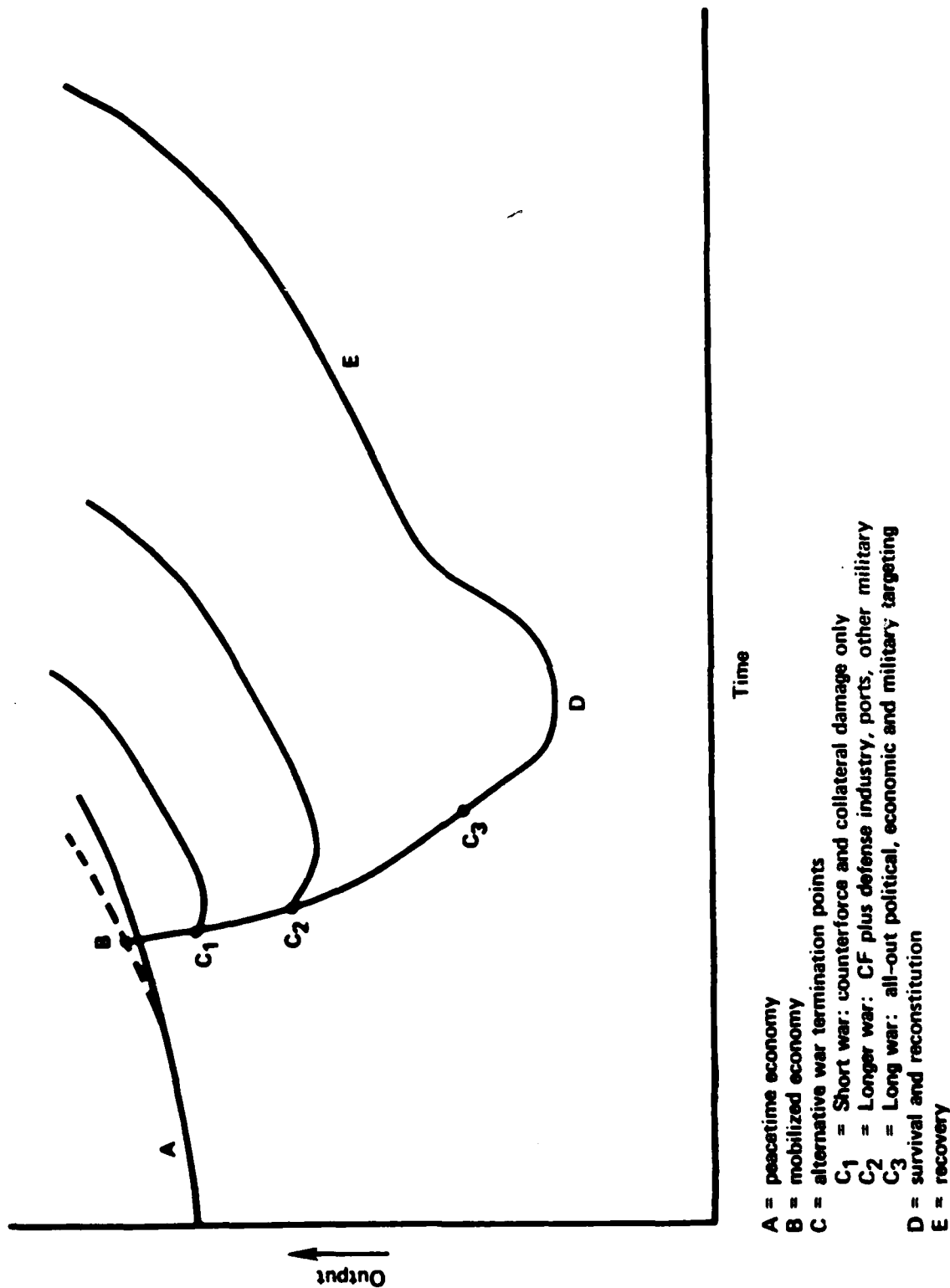


Figure 3 THE MEASUREMENT PROBLEM: EVALUATING THE ECONOMICS OF SOVIET CIVIL DEFENSE

Union devotes 11-12 percent of its GNP to military expenditures,¹ corresponds roughly to the 13 percent reached in the United States at the 1953 peak of the Korean mobilization effort. Soviet planning includes provision for further mobilization in crisis, as shown in the dashed segment B. The United States is not today mobilized, but mobilization plans might well be part of a set of U.S. policy options to be considered.

Point C_1 shows a modest amount of economic damage. It reflects the collateral effects on the economy of a counterforce-only attack followed by a negotiated settlement. This would be a short war, with cities spared. Even here, there is a wide range of uncertainty in the measurement of collateral damage, which would vary as a function of attack tactics (number, yields, and fission ratios of attacking weapons; air vs. ground burst; time of day of attacks; etc.) and of defense tactics (civil defense plans, measures and readiness, and active defenses). These factors might have more effect on population casualties than on economic facilities, and one can assume that, despite the terrible human losses, the economic Recovery would start quite promptly after relatively localized and brief Recuperation and Reconstitution phases. Clearly, civil defense preparations could have great effect.

Alternatively, we might think of the point C_1 as representing a nuclear terrorist attack on a large city. The last two sentences of the last paragraph would still apply.

Point C_2 indicates a longer war, in which the counterforce attack is broadened to include defense industries, ports, and other military targets. Economic damage as well as casualties could be quite significant, and Reconstitution and Recovery would take much longer. But, despite uncertainties about time, the feasibility of Recovery would appear to be clear and the effects of civil defense significant.

¹

CIA "A Dollar Cost Comparison of Soviet & U.S. Defense Activities, 1968-78," SR-79-130004 (January 1979).

Point C_3 shows a long war, with major, perhaps all-out, attacks on economic and military targets of all kinds, involving very large urban-industrial casualties and damage. The objective would be presumed to be to prevent Soviet economic, political, and military power Recovery or to make this Recovery slower than that of the United States. It is here that the measurement problem becomes most serious and the effects of beliefs on the estimates of nuclear effects and civil defense effectiveness most profound. The Recuperation and Reconstitution phases would be much longer and more uncertain. Tools for the description and estimation of their parameters are largely lacking, or undeveloped. If Survival and Reconstitution can be shown to be feasible under these conditions, Recovery can be shown to be feasible, but the rate may be very low and highly unpredictable.

Note that C_3 has been described as a "long war." This simplification may obscure an indefinitely broad range of possible scenarios for intensive nuclear war (sometimes called "all-out" war). Not only may the many possible ground, air and sea campaigns be long drawn-out, but the nuclear exchange may also take place in many stages. Early on, "staged attacks" (initially counterforce) might take place not in minutes or hours (which would appear to be one stage) but at intervals of days or even weeks, leaving time for negotiation between stages. Months between stages would risk giving the other side too much time for further replacement and buildup. On the other hand, to the extent that countervalue targeting becomes involved, intervals measured in months may be quite effective, both in destroying rebuilt assets and in discouraging rebuilding. Some have suggested that the expectations of further nuclear attacks would completely shatter morale and eliminate any motivation to rebuild--in effect, it would destroy the national entity. Others counter that a continuing external threat may be, as in many past cases, the cement of social and political cohesion; that this will cease to be true in nuclear war has not been demonstrated.

How to know when nuclear war is over may be very difficult. If one

side used up all of its nuclear assets and the other had remaining reserve nuclear weapons with which it could carry out continued staged attacks, the latter would have won the war--as is often noted in Soviet doctrinal writings. In actuality, the situation may not be that clear. Nonnuclear conflict may persist, the need for conventional forces may affect post-exchange production requirements--and conventional forces may dominate production feasibilities. While output is measured in Figure 3 on the same scale throughout, it should not be overlooked that the composition and value of pre-, trans-, and postwar output would be very different, at least until Recovery was completed. Moreover, there is no attempt here to define "complete" Recovery. It might be measured, say, by the attainment of prewar aggregate levels, per capita levels (sooner, if more non-workers are killed!), standard of living, national military power, etc., or of the level of one of these measures projected "as if" the war had not occurred. We cannot yet predict (nor do we need to at this stage) what will be an appropriate criterion of "complete" Recovery in the postwar environment.

This graph also serves to illustrate our contention in the Introduction that consideration of Recovery in all-out attack such as C_3 is premature. The term is relevant for C_1 , which involves damage comparable to a very major disaster, but leaves most of the country intact. Survival and Reconstitution would not therefore come in question. A brief period of Recuperation would be required as indicated by a slight dip in the curve to the right of C_1 , but economic Recovery would be a reasonable expectation. To a large extent the same can be said of the point C_2 . This would be an unprecedented kind of catastrophe for the United States, though not for the Soviet Union or other countries that have lived through more major wars on their territory. Survival and Reconstruction might be serious problems, but as will be discussed below, planning could presumably virtually ensure them, and Recovery, and the policies most appropriate to it, are proper subjects for analysis. At point C_3 , however, Survival, Reconstitution and Recuperation are far from certain, particularly in

the absence of the types and levels of preparation undertaken in the Soviet Union. We must, therefore, focus on Survival and Reconstitution in the indefinitely long period D, before the study of plans for E, real Recovery, are relevant.

III THE THREAT

The question of the politico-military utility of CD/CEP is moot if there is no threat to CONUS. The brief discussion of the range of scenarios in the body of this report suggests a variety of possible threats which the authors had in mind as a basis for their analysis. No attempt was made to assign probabilities to these scenarios. In fact, most scenarios are implausible, including many historical ones, e.g., the start of World War I, World War II, Korea, and Viet Nam. It is hard to write a plausible scenario for World War III. Yet few would deny that there are many plausible sources of conflict between the United States and the Soviet Union, including conflict over issues which both sides would regard as involving "vital" or "supreme" national interests. Can anyone deny that such conflict could result in armed conflict and that such conflict could escalate to nuclear war between the only two possessors of large nuclear arsenals?

We do not postulate here an attack "out of the blue." Such an attack is essentially a contradiction in terms,¹ since there must be a conflict and tension if there is to be any purpose to a nuclear--or even conventional--attack. War is an extension of diplomacy in the sense that it is initiated as an attempt to obtain something not achievable without war, something the peaceful achievement of which has been frustrated.

On the contrary, this paper is concerned primarily with the influence of national posture on diplomatic coercion, both before and during a war--the latter being also called control of escalation. Damage limiting

1

This is not to say that there cannot be surprise--a paramount Soviet objective. Pearl Harbor was not out of the blue, but it certainly represented successful surprise. Even in crisis, a country--perhaps particularly the United States--may succumb to deception and/or simply fail to react to strategic warning.

capabilities are part of the calculus of such coercion and control. We will therefore outline a potential threat to the United States by the Soviet Union, not as a prediction, but as an existence-proof for the reality of potential threats. We will use a 1982 scenario, both to convey our sense of the urgency of the problems analyzed and because the forces that will exist at that time can be predicted with some confidence, and indeed cannot in only three years be fundamentally changed from those resulting from current programs in both countries.

Table 1 gives the approximate strategic offensive forces (SOF) balance in 1982, consistent both with what is known of current programs on both sides and with SALT II, whether or not the Treaty has been ratified by 1982. The forces are specified by four commonly used measures:

- The number of strategic launch vehicles (missile launchers and heavy bombers--the principal items limited and presumed verifiable, under SALT II);
- The total megatonnage (millions of tons of nuclear yield) carried by these vehicles;
- The numbers of warheads among which this megatonnage is divided (reflecting, for the ICBMs, vastly larger yields of the Soviet warheads);
- The hard target kill capability of these warheads.

We have assumed that SALT II limits are observed with respect to numbers of launchers, MIRV launchers, and numbers of MIRV warheads permitted in each type of launcher. The Soviet BACKFIRE bombers (and old BADGERS as well) are not counted.

The significant point in this Table is the high prompt kill capability of the Soviet ICBMs, especially that of the 308 SS-18s with ten 3/4-megaton warheads each. One-third to one-half of these missiles could destroy 90 percent of the U.S. ICBM forces in 1982. A few more Soviet missiles could destroy the one-fourth to one-half of all U.S. SLBMs in

TABLE I
U.S. AND SOVIET STRATEGIC OFFENSIVE FORCES IN 1982

A. Number of Strategic Nuclear Launch Vehicles (SNLVs)

	<u>U.S.</u>	<u>U.S.S.R.</u>
ICBMs		
- MIRV	550	820
- Non-MIRV	504	390
Total	1,054	1,210
SLBMs		
- MIRV	640	296
- Non-MIRV	160	680
Total	800	976
Heavy Bombers		
- Non-ALCM	331	64 ¹
- ALCM Carriers	15	0
Total	346	64
TOTAL SNLVs	<u>2,200</u>	<u>2,250</u>

C. Number of Warheads

	<u>U.S.</u>	<u>U.S.S.R.</u>
ICBMs		
- MIRV	1,650	5,752
- Non-MIRV	504	970
Total	2,154	6,722
SLBMs		
- MIRV	5,456	2,912
- Non-MIRV	480	1,080
Total	5,936	3,992
Heavy Bombers (ALCMs, SRAMs, Gravity Bombs)	2,824	260
TOTAL WARHEADS	<u>10,914</u>	<u>10,974</u>

B. Total Megatonnage

	<u>U.S.</u>	<u>U.S.S.R.</u>
ICBMs		
- MIRV	430	4,314
- Non-MIRV	1,026	1,935
Total	1,456	6,249
SLBMs		
- MIRV	364	582
- Non-MIRV	105	777
Total	469	1,359
Heavy Bombers (ALCMs, SRAMs, Gravity Bombs)	1,624	260
TOTAL MEGATONNAGE	<u>3,550</u>	<u>7,868</u>

D. The Hard Target Kill Capability (CMP)²

	<u>U.S.</u>	<u>U.S.S.R.</u>
ICBMs		
- MIRV	46,175	211,169
- Non-MIRV	13,188	29,170
Total (Prompt CMP)	59,364	240,340
SLBMs		
- MIRV	14,059	13,871
- Non-MIRV	697	2,702
Total (Prompt CMP)	14,757	16,574
TOTAL PROMPT CMP	74,121	256,914
Heavy Bombers (ALCMs, SRAMs, Gravity Bombs)		
(Delayed CMP)	158,729	8,000
TOTAL CMP	<u>232,851</u>	<u>264,914</u>

¹ Excludes BACKFIRES and BADGERS.

² CMP (Counter Military Potential) = $\frac{nY^{2/3}}{(CEP)^2}$, where n = number of weapons
Y = yield in megatons
CEP = circular error probable (radius of circle in which 50% of weapons are expected to hit)

port,¹ plus many essential command-control facilities. A few Soviet submarine loads of SLBMs could kill all nonalert U.S. bombers and probably some of the 30 percent or less on strip alert under current rules. The remaining balance could be roughly that shown in Table 2. The bulk of the surviving U.S. forces, in the only category in which the U.S. surviving weapons would exceed the Soviet withheld weapons, are the SLBMs. Until more TRIDENT SLBMs come on line, these weapons (POLARIS/POSEIDONs) have low yields and low accuracy (and at this point in the scenario, probably also downgraded command control). They could be used against soft targets only, i.e., targets located mostly in cities. U.S. cities would still be held in hostage by the Soviet Union to deter such attacks on their cities. An equal countervalue exchange at this point would leave the Soviet Union with greater withheld reserves than the United States.

But if these residual forces were to be used, we must take count of the strategic defenses forces (SDF) each side would face. Here we find the asymmetry far greater than that in SDF--indeed, in almost every category the asymmetry is overwhelming.

Let us start with the least asymmetrical case, that of ballistic missile defense. The Anti-Ballistic Missile (ABM) Treaty creates nominal equality. The 1972 Treaty permitted each side two defensive sites with 100 interceptive missiles each. The 1974 Protocol reduced this to one site. In 1975, the United States unilaterally dismantled its one permitted site. The Soviets still have theirs, though it is not believed to be very effective. More importantly, however, Soviet ABM R&D effort greatly exceeds that of the United States, and there is a real possibility of a Soviet break-out from the Treaty sometime in the 1980s, on a time scale to which the United States could not respond.

¹ With strategic warning, up to three-quarters of the U.S. strategic submarines could be in a generated force at sea. They might not be, however, because: (1) the warning time might prove too short; or (2) the response--as in numerous historical cases--might be too slow or too little, for political or bureaucratic reasons.

TABLE 2

U.S. AND SOVIET STRATEGIC OFFENSIVE FORCES REMAINING AFTER SOVIET FIRST STRIKE
(Number of Launch Vehicles)

	<u>U.S.</u>	<u>U.S.S.R.</u>
ICBMs		
- MIRV	55	600-690
- Non-MIRV	50	390
SLBMs		
- MIRV	320-480	168-232
- Non-MIRV	80-120	680
Heavy Bombers	<u>80-100</u>	<u>64¹</u>
TOTAL VEHICLES	<u>585-805</u>	<u>1902-2056</u>

¹ Excludes BACKFIRES and BADGERS.

After the signing and ratification of the ABM Treaty, the United States dismantled its once significant continental air defenses, on the argument that they were irrelevant if we were vulnerable to the missile threat. But the Soviet Union continues to modernize its vast defense system. It may also be noted that since the fall of Iran, the likelihood is high that the Soviets have acquired the training and maintenance manuals for the F-14/Phoenix missile system, with its high-technology look-down, shoot-down capability, and quite possibly one or more F-14s as well; these acquisitions can give the Soviets a quantum lead in the only air defense technology in which they have appeared to lag seriously behind the United States, namely that of "look-down, shoot-down" capability to (1) direct radar toward the sea or ground and track low-flying aircraft or missiles, while adequately rejecting clutter reflected from the surface of the earth, and (2) accurately fire air-to-air missiles that can hit such targets.

The significance of the heavy Soviet air defenses as compared with the token U.S. defenses (6 squadrons of obsolete F-106s) lies in the fact that the not dissimilar numbers of heavy bombers surviving (Table 2) will have vastly different attack potentials. The numbers of U.S. bombers--80 to 100--are too small to permit the massing tactics that are typical of bomber mission planning for penetration of Soviet defenses, unless their attacks were to be concentrated on one small area of the Soviet Union. In contrast, the 64 remaining Soviet bombers (none of which were used in the counterforce attack), supplemented by any number (up to 100-200) of the BACKFIRE bombers and aging BADGERS that the Soviets chose to reassign at this time from their naval and theater missions, would have a virtually free ride over the United States, in an armed-reconnaissance mode, seeking out any surviving hard targets as well as non-time urgent targets to which the Soviets may assign priority.

The effectiveness of surviving U.S. forces may be severely downgraded by initial Soviet attacks on command control facilities, including those by anti-satellite (ASAT) defenses, since the Soviets have operational

systems capable of knocking out many of our space-borne eyes and ears in a crisis or at the outset of nuclear conflict. The United States has belatedly started a small R&D program to meet this threat, with no acknowledgement of the fact that we abandoned such a program in 1963 as not having a military mission (sic). Sadly, the U.S. program of the early 1960s utilized a better approach than that of the Soviets today, namely the so-called direct ascent use of ABM-type interceptor missiles of the NIKE-X ABM system as against the Soviet launching of satellites into quasi-co-orbit with the satellites to be attacked and depending on orbital adjustment foreclosure to kill. The latter approach is much slower, permitting the possibility of countermeasures, and less efficient in terms of the amount of booster power required.

The Soviet ASAT capability is effective, to date, against low-orbit satellites only, not against "stationary" satellites in 22-thousand-mile high orbits. We cannot know, however, whether the Soviets have deployed or will deploy high-altitude nuclear "space mines" that could take out stationary-orbit satellites in the first moments of a war. (They could even do this by detonation at the "conjugate point" 180° away, on the other side of the earth.) Such mines would violate the Treaty on Outer Space, but that Treaty is not verifiable. Their use might also blind Soviet stationary satellites, but (1) the Soviets are less dependent than the U.S. on such satellites and (2) with the initiative, the Soviets could plan to replace their satellites whereas we are not prepared to do so promptly, and in any event their temporary loss at the outset of a nuclear attack would seriously degrade our warning time and battle management.

Finally we come to the dramatic asymmetry in Civil Defense preparations discussed at length in this report. What this asymmetry means is that the soft target capabilities remaining to the United States, which are a formidable threat even if inferior to the threat posed by the Soviet forces, must be downgraded by whatever expected value one chooses to assign to the effectiveness of the Soviet civil defense system. As described in

the report, Soviet civil defenses emphasize the protection of military, Party and government leadership and key workers. These "key workers" are not just industrial labor, but also municipal and other infrastructure personnel who are keyed to the Survival and Reconstitution phases. There are also production plans, stockpiles, etc., to facilitate Recovery, if Survival and Reconstitution are achieved. In short, even an only partially effective civil defense will make a difference, and an unpredictably effective civil defense must play an important role in deterrence.

It is respectfully submitted that the above scenario is indeed a proof of the existence of a real threat. We can only add that, while this study focuses on the Strategic Offensive and Defensive Forces, one cannot ignore the General Purpose Forces. Those of the Soviet Union are known to be much larger and in most categories considerably to exceed those of the United States in equipment as well as personnel. Without attempting here an analysis of the differences between the two nations' General Purpose Forces, which would have to take account of qualitative differences and contrasting requirements in terms of external threats, alliances, etc., it suffices here to observe that to the extent that the United States permits a period of potential Soviet strategic nuclear superiority, differences in General Purpose Forces (including theater nuclear forces) must take on a far greater significance than they did when the United States had a clear nuclear superiority. Any potential Soviet post-nuclear-exchange superiority in General Purpose Forces, including Naval Forces, may have a profound effect on the potentials of the two sides for Survival, Reconstitution and Recovery.

IV ALTERNATIVE PHILOSOPHIES OF SURVIVAL AND RECONSTITUTION

Section II indicated that if the nuclear phase of war is terminated at an early stage, the damage may be likened to that of a natural disaster and Recovery can be treated as a problem to be managed, rather than a question of feasibility. There may, however, be an ongoing theater and oceanic war, and therefore local Survival and Recuperation must be managed within a mobilized wartime economy in which Recovery in the peacetime sense is postponed. Unfortunately, we cannot know in advance whether the nuclear war will terminate at this early point. National planning must therefore encompass points C_1 , C_2 , and C_3 (or the broad spectrum of possibilities that these three points were arbitrarily selected to represent). A deterrence-only philosophy, however, treats nuclear war as a disaster, or "natural event," and makes no serious preparation for such an event which might "get out of hand" and reach point C_3 . Such a posture --the present posture of the United States--involves the protection of military C^3 , but without providing it with endurance. It involves a minor and potentially ineffective continuity of government (COG) program, little preparation for war mobilization, and limited capability for war termination efforts. (See Figure 4.) It is not a viable approach. Lack of intent and preparation to survive may be a self-fulfilling prophecy.

An increased level of concern (say, associated with an expectation of attack C_2) might be termed the Military-Planning-Only philosophy. To the preparations under the Disaster philosophy it would add endurance for military C^3 and some mobilization and war termination capabilities. The third alternative philosophy would be that of National Entity Survival. Such a philosophy requires the addition of a serious and enduring COG protection program, to ensure civilian control of the military at all times; war-fighting and war-termination capabilities at all levels of attack; communication with the populace and management of the survival, reconstitution and recovery phases; and eventual reconstitution of the constitutional

PHILOSOPHY	METHOD	OUTCOMES AND OBJECTIVES
A. DISASTER, OR "NATURAL EVENT" Deterrence only: military C ³ protected but no endurance; Little COG protection. Little war mobilization capability - or only USSR has it	(See Figure 8)	(See Figure 8)
B. MILITARY PLANNING ONLY Add: endurance to military C ³ , some war mobilization and termination capability		
C. NATIONAL ENTITY SURVIVAL Add: COG protection and endurance with civilian control of military at all times; war fighting and termination capability at all levels of attack; CD/CEP		

Figure 4 THREE PHILOSOPHIES OF PREPARATION FOR
SURVIVAL AND RECONSTITUTION PHASES
BETWEEN INITIAL ATTACK AND RECOVERY

government and the national entity as it had been known before the war. It would also require a large and effective CD/CEP program.

The methods appropriate to these alternative philosophies, and the outcome that may be possible, are left blank on this figure; filling them in is the subject of the remainder of this study.

A. Goals of CD/CEP

We have already alluded to the gross asymmetry between the Soviet and U.S. CD/CEP, or non-military, defense preparations. It does not appear necessary to discuss these in detail here. The discussions elsewhere have been extensive.¹ It will suffice here to recapitulate the goals of the Soviet CD/CEP programs, as described in the DCI document (1) and the SRI document (9) cited below. These programs have three primary goals:

1. The protection of the Communist Party (CPSU), the military-governmental infrastructure, "key workers" and people. The priorities here are clear. They are: (a) protection of the leadership (corresponding to the U.S. concept of continuity of government, including the top

¹ See (1) Soviet Civil Defense, unclassified report, Director of Central Intelligence, July 1978; (2) "An Analysis of Civil Defense in Nuclear War," U.S. Arms Control and Disarmament Agency, NI 78-1003, December 1978; (3) "The 'Mine Shaft Gap' Revisited: Soviet Civil Defense and U.S. Deterrence," U.S. Representative Lee Aspin, December 1978; (4) an evaluation of (1)-(3), "Toward a More Balanced View of Soviet Civil Defense: A Critique of Recent U.S. Assessments," Advanced International Studies Institute for Defense Nuclear Agency, June 9, 1979; (5) Leon Gouré, War Survival in Soviet Strategy, USSR Civil Defense, (Miami: Center for Advanced International Studies, University of Miami, 1976); (6) Chuikikof, Civil Defense (Grazhdanskaya Oborona) (Moscow: 1969) translated and edited by Oak Ridge National, April 1971; (7) T.K. Jones, Testimony to House Armed Services Committee, Subcommittee on Investigations, Civil Defense Panel, February 26, 1976; (8) "The Politico-Military Utility of Soviet CD/CEP Strategic Defense Systems and Their Significance for U.S. Nuclear Targeting Policy, Volume 1," SRI International for Defense Nuclear Agency, Contract DNA 001-78-C-0352, Section 3, p. 15; and (9) "The Soviet Concept of National Entity Survival," op. cit.

civilian leadership and military command but extending to all levels of civilian government and Party, from what in U.S. terms would be Federal through State down to local, and adding key industrial management personnel; (b) the essential work force; and (c) the remainder of the population. Note that these priorities are quite different from those of existing and proposed U.S. civil defense programs, which always emphasize population per se.

2. The protection of the sources of economic productivity; assurance of the continuity of economic activity in wartime; and measures to facilitate the restoration of production following a nuclear attack.

3. Sustaining the surviving population in the period immediately following a nuclear attack and preparing for longer-term postattack recovery.

These goals reflect the Soviet view of the value of civil defense in enhancing deterrence (by reducing the potential effectiveness of the enemy's deterrent) in peacetime and in crisis, when deterrence supports nuclear-backed diplomatic coercion, as well as the value of civil defense in war fighting, in both a short war and a long war. It appears, but with considerably less certainty, that the Soviets also view civil defense as having a positive contribution to make in the contingency of a limited nuclear war and in escalation control. In contrast, as noted earlier, the United States tends to view civil defense as of negative utility in peacetime and crisis deterrence and as of questionable utility in war fighting.

In the face of these asymmetries--those in CD/CEP and views of its utility, as well as the earlier-outlined asymmetries in national objectives, military postures, and doctrine--we come now to the consideration of U.S. policy alternatives for reducing or negating these asymmetries. We will consider first options for doctrinal change and possibly implied force changes, and then options for corresponding or offsetting U.S. CD/CEP programs.

B. Doctrinal Change—Alternative U.S. Targeting Strategies

In light of the above, Figure 5 shows schematically how: (1) Soviet CD/CEP can have an effect on deterrence and risk-taking propensities at every stage of pre-war and limited-war conflict as well as a damage-limiting role in limited and general nuclear war; and (2) the estimates and calculations of these effects will have implications for U.S. targeting policy.

It is not possible, without reference to intelligence of the most sensitive and technical nature, to suggest specific modifications in U.S. targeting priorities. Recent trends in the international security environment examined in this report do suggest, however, certain possibilities for significant criteria that ought to be emphasized in the evaluation of targeting priorities.

1. It should be basic to any U.S. doctrine that targeting ought to be addressed to Soviet values and strategy and not to Soviet targets ranked by U.S. values in accord with a U.S.-preferred strategy. The assumption must be made that the Soviets believe in their own value system, and hence any threat to those values will have considerably more deterrent impact than a threat to values that are "mirror-imaged" and may not be shared by the Soviets. It should now be evident that the United States can neither persuade nor force the Soviet leadership to adopt the U.S. strategic doctrine and its consequent target value systems. The United States may also be less self-deterred by targeting Soviet values than by targeting according to U.S. values, with the corollary assumption that the Soviets would do the same against us. For example, if population is the highest-value U.S. target but in fourth place in the Soviet target value system, then the President might well be unwilling to implement his targeting plan; if the Soviets put leadership first, and leadership headed the U.S. target list, the President might be more willing to threaten or implement his first-priority attack, and the Soviets might be more likely to withhold their attack and to negotiate.

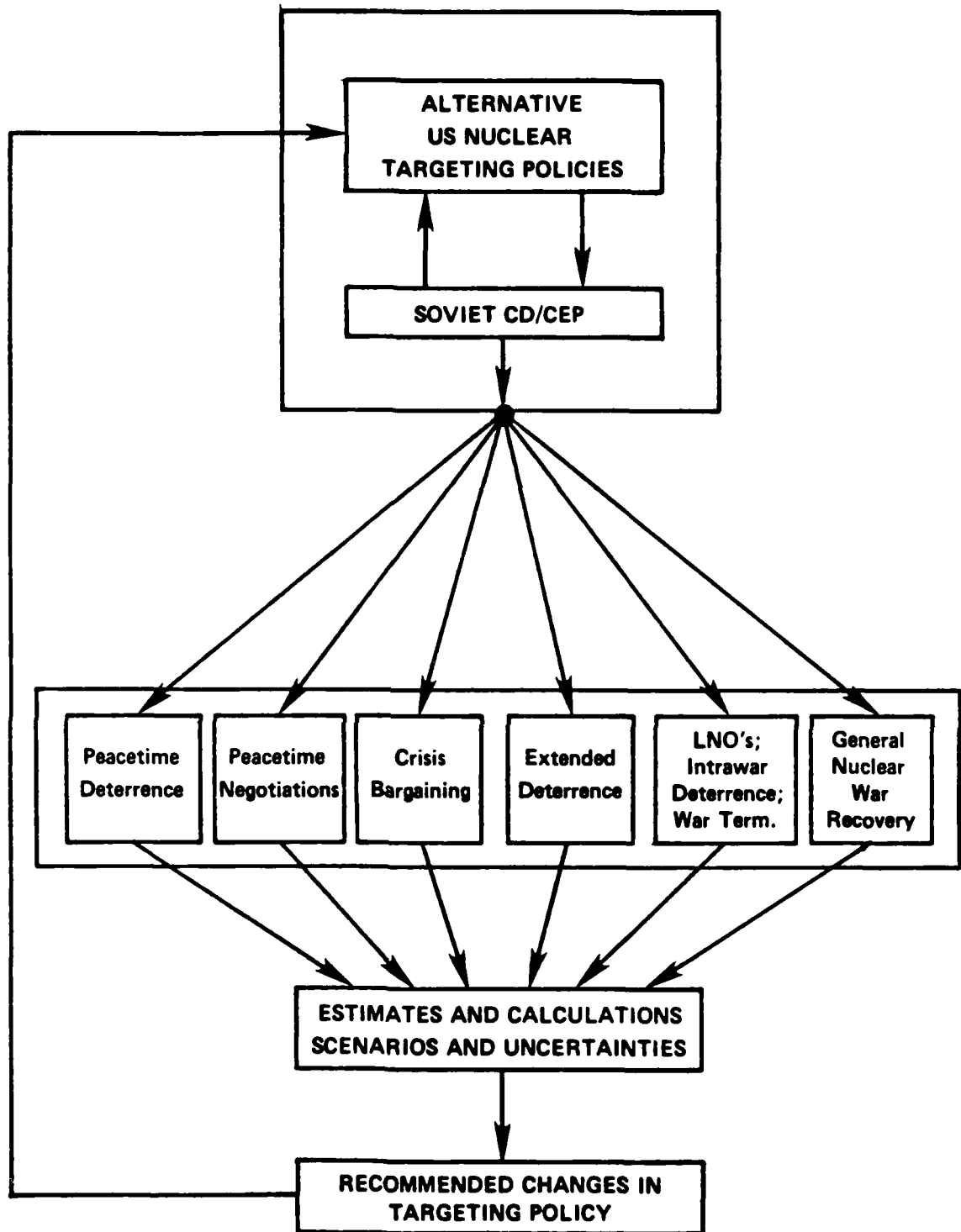


Figure 5 METHOD OF INTRODUCING SOVIET CD/CEP FEEDBACK EFFECT ON U.S. TARGETING POLICY

And finally, if deterrence fails, it must be assumed that the damage caused by targeting Soviet values will produce a less favorable outcome for the Soviets than if we had targeted according to U.S. values.

2. While many intelligence and other sources may be used in deriving estimates, passive defenses may be one of the most revealing measures of Soviet values. Through artificial enhancement of sometimes inherent characteristics, passive defense employs concealment, hardening, dispersal and mobility to reduce the vulnerability of given targets. Such defense measures are specific to the targets, and the degree of effort expended to defend given targets is among the strongest indicators of the values that the Soviets attach to them.

Soviet doctrine implies, and observed passive defense measures give evidence for, the following assessment of Soviet priorities (adding military passive defenses to the civil categories cited earlier).¹

a. Leadership

This category begins with the Party (CPSU) and, with obvious priority at the top, extends to the local level, with an estimated 110,000 people covered. Command-control installations and facilities include both civilian and military officials. This marked leadership priority is highly consistent with the systemic imperatives for regime maintenance as well as for control of military and economic activities and of the population as a whole.

b. Military

In this category the highest priorities are accorded to strategic forces, to C³, and then to Other Military Targets (OMT). The next level includes direct military industry (e.g., nuclear processing and weapons production, and military advance production), both the facilities themselves and attendant labor forces.

¹ Ibid., especially (1)

c. Essential Industry

This category also includes both production facilities and labor, and vital infrastructure.

d. General Population

The Soviets have prominent programs for the survival of General Population. But at the same time, it should be recognized that (assuming essential workers are included in the Essential Industry--not General Population--category) the greater the surviving population, the greater the burden on Recuperation and the initial stages of Recovery. This would be particularly the case in the event of high numbers of injured survivors (possibly necessitating the employment of a harsh triage doctrine). In the longer term, of course, new workers for advanced stages of Recovery must come from the General Population. Conversion of workers to new and immediately necessary activities could accelerate this process significantly. Morale could be relatively high because of both prewar training programs and the provision of specific trans- and post-attack tasks and responsibilities for all.

Significant numbers of the General Population would be killed even under the most pure targeting strategies aimed at Leadership, Military and Recovery capabilities. Minimizing rather than maximizing the initial strike may help--employing controlled escalation, aimed at inhibiting Recovery and encumbering Political Control. Collateral damage is inevitable and optimization is difficult, as there is really no common denominator for equalizing at the margins. But still it probably can be shown that some combinations of time-phased attacks would yield greater returns than others.

3. Targeting doctrine must take into careful consideration the interaction of potential destructive effects on alternative possible targeting categories. The relationship between Leadership, Military Capabilities, Recovery Capacity and Population is imperfectly understood and,

to a degree, this is inevitable. In addition, there will undoubtedly persist a very substantial measure of target co-location among the categories, so that "pure" targeting strategies are rendered infeasible.

Still, certain fundamental patterns of interaction should continually be borne in mind. Each of the above-mentioned categories is necessary, but not sufficient, for Recuperation, Reconstitution and Recovery. Leadership is necessary to maintain authority and cohesion, to direct military and civil activities, and to negotiate with the enemy and other international actors, before, during and after a potential nuclear exchange. It is also required for direction of Reconstitution and management of Recovery, to a greater degree in the Soviet Union (a permanent command economy) than in the United States (partially a command economy in wartime).

Military capabilities are particularly crucial, in the Soviet system, to the maintenance of Leadership control as well as to preserving domestic order and conducting such military operations against peripheral threats as deemed necessary and feasible. The sub-category Other Military Targets (OMT) includes all conventional forces as well as theater nuclear (or non-strategic nuclear) weapons that could become "strategic" if exchanges have exhausted the initial stockpiles of strategic nuclear weapons. The employment of these weapons, in combination with surviving conventional capabilities, would be basic to controlling the post-exchange power balance and to both assisting Soviet Recovery through the acquisition of external resources and retarding U.S. Recovery through interdiction.

Over any protracted period, however, sustaining Military Capabilities obviously requires Recovery capacity in order to support both direct and indirect military measures as well as to support the General Population.

4. Targeting must take into account what is feasible as well as what is desirable. If it is assumed that the most valuable targets will also be the best defended, there will no doubt be cases in which targeting

of a lower-value but more vulnerable objective may yield a higher damage expectancy (DE). Leadership and certain Other Military Targets (OMT), for example, might be of high value but of low DE, if we do not know where they are or if their destruction is precluded by successful passive defense measures other than concealment.

The Leadership shelter capacity in particular appears to be almost invulnerable. We can attack the small proportion of known targets only, and even then we cannot be certain whether they are occupied, or by whom. Most of these facilities will also be very hard. Attacking communications facilities can also impair Leadership, at least in the short run--but this too will be difficult from a practical standpoint.

The vulnerability of certain military targets can be reasonably calculated, while others are completely unknown qualities. Indirect attack on military capabilities through destruction of industrial plants is more practical (although DE in this area tends to be overestimated in current analytical models). Identification and destruction of attendant labor forces, however, presents more difficulty. Similar considerations would seem to apply to critical Recovery industries not directly related to military capability.

General Population, in contrast, presents low to moderate vulnerability. It can be protected by civil defense--both in-place shelters and dispersal by city evacuation. As demonstrated in Science Applications, Inc., studies for DNA, evacuation can greatly reduce casualties. Retargeting may partially restore the Population casualties, but at the opportunity cost of greatly reduced destruction of Political, Military and Economic targets.¹

¹ Roger Craver, Marvin Drake, Joe McGahan, J. F. Schneider, E. Zwick, "The Feasibility of Population Targeting" (U), Science Applications, Inc., DNA5010 (1979) SECRET.

Pure targeting is quite impossible, and high collateral damage is to be expected under almost any circumstances of heavy attack. Still, improvement in the feasibility of destroying desired targets would be achieved. This would require overt modification of priorities and increased intelligence efforts to identify and locate appropriate targets. In addition, R&D efforts aimed at the tailoring of weapons could also have a significant impact. In this regard, increased accuracy, earth penetration capabilities, controlled area munitions, and enhanced radiation might receive priority vis-a-vis particular types of targets.

5. Calculations must be made with explicit reference to a dynamic model of potential nuclear exchange. Vulnerabilities exist on both sides and, although varying significantly, will continue to exist after the first strike. Thus, planning most emphatically should not take place solely with reference to an all-out one-time exchange. Even at extreme levels of destruction, the effective employability of surviving military capabilities will be the most significant determinant of the post-exchange balance and perhaps of Recovery prospects as well.

Because civil defense has these across-the-board implications, as was suggested in Figure 5, we have considered a range of options for U.S. targeting that may contribute to the restoration of deterrence of the Soviet Union, under conditions of a large asymmetry between U.S. and Soviet CD/CEP preparations. These options operate principally through the mechanism of increasing the uncertainties imposed on the opponent, as suggested in Figure 6.

The last sentence is simply a truism. What is important today is that the Soviet Union has moved steadily for many years to increase its strategic options and U.S. uncertainties. This has meant the achievement, by the early 1980s, of impressive counterforce capabilities (SS-18) and the threat of a first strike that will increase their already marked advantage in nuclear capabilities, i.e., in strategic reserve forces. Large strategic reserves offer the potential of being the party with the

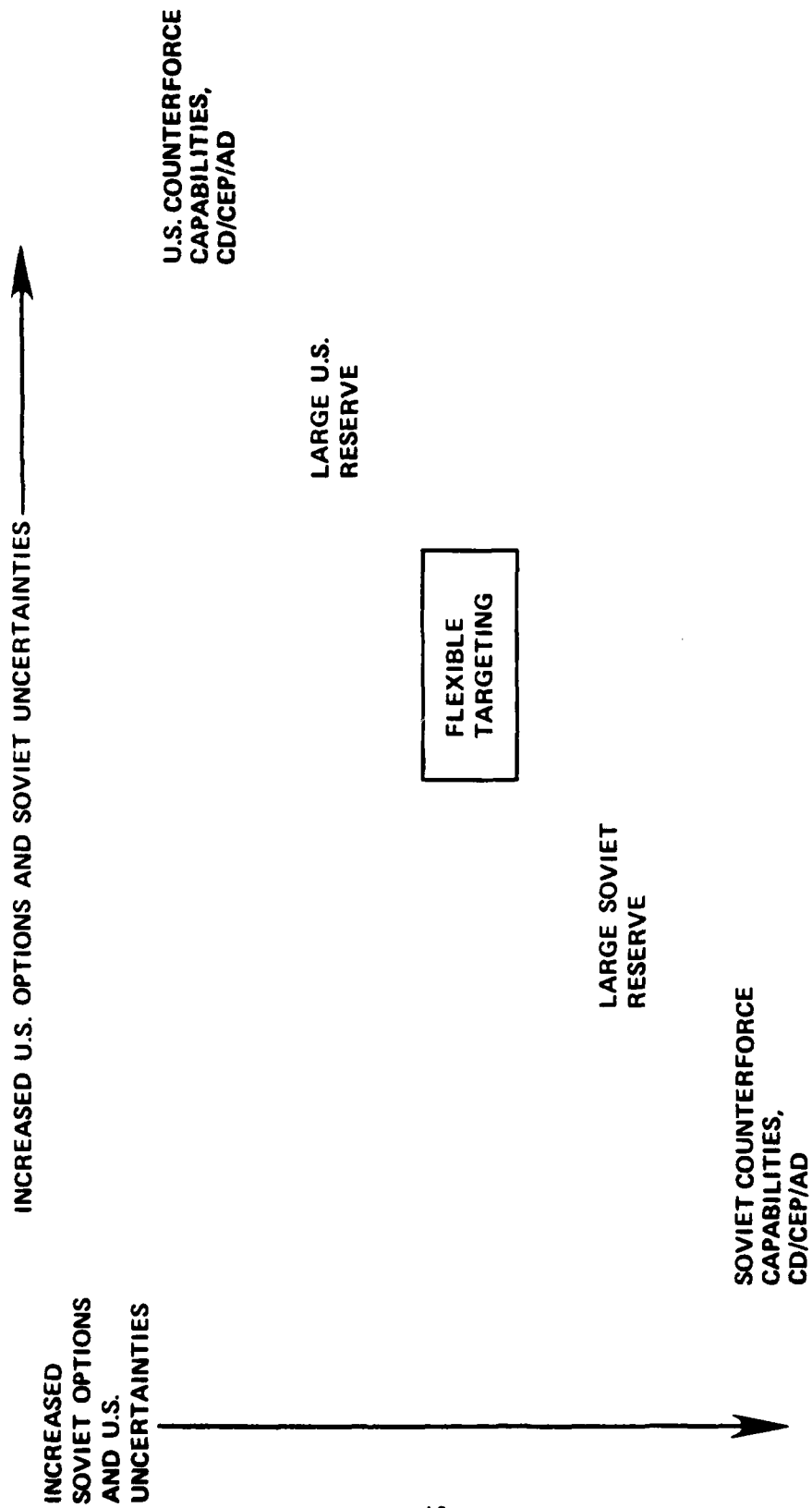


Figure 6 IMPACT OF ADDING OPTIONS ON OPPONENT'S UNCERTAINTY OF OUTCOME

remaining reserves when the opponent's weapons are exhausted--one Soviet definition of the winner of a nuclear war. This Soviet achievement has been accompanied by the building of vast strategic defenses in addition to damage-limiting missile capabilities: heavy air defenses, ABM Treaty breakout potential, antisatellite weapons, ASW, and--the focus of this study--intensive CD/CEP preparations. The United States, in contrast, has denied itself the options of adequate counterforce potential, adequate forces to permit reserve forces that could deny Soviet post-exchange control, and active and passive defenses that could impose symmetrical uncertainties on Soviet attack planners.

C. Alternative Targeting Emphases

Figure 7 is, in effect, an exploded diagram of the black box, labeled Flexible Targeting, at the center of Figure 6. It summarizes the implications of alternative emphases in a mixed strategy. Each column shows the probable effect of emphasizing a given target class on the remaining target classes (as shown in each horizontal row of boxes). The bottom row, below the double line, shows the effect of the Soviet CD/CEP programs on the effectiveness of the potential U.S. targeting emphasis (and, by implication, of a potential U.S. CD/CEP program on Soviet targeting options).

One notes immediately that a Population targeting emphasis would require more U.S. weapons, but would be defeated by an even partially effective Soviet civil defense (see lower lefthand box). In the next column, a Recovery or economic targeting emphasis would also require more weapons plus enduring reserve forces and C³ capability, but would be weakened, if not defeated, by Soviet CD/CEP.

A Political Control emphasis--targeting Leadership--could have very high potential payoff but would certainly require far better intelligence than is available today, as well as tailored weapons capable of attacking hard, deep underground shelters, because of the priority Soviet Civil

EMPHASIS ON: →

EFFECT ON: →

	POPULATION	RECOVERY	POLITICAL CONTROL	MILITARY POWER
POPULATION	ASSURED DESTRUCTION OF NATION	COLLATERAL	COLLATERAL	COLLATERAL
RECOVERY	SIGNIFICANT	DENY NATIONAL RECOVERY	SELECTIVE	SELECTIVE (MILITARY SUPPORT ONLY)
POLITICAL CONTROL	?	?	DESTROY CENTRAL POLITICAL CONTROL OVER SOVIET REPUBLICS	?
MILITARY POWER	STRATEGIC NUCLEAR TARGETS	WEAKENS LONG TERM SUPPORT	DESTROY MILITARY C ² AND MAJOR WEAPONS AND FORCE CONCENTRATIONS	DEFEAT SOVIET STRATEGIC AND THEATER NUCLEAR AND CONVENTIONAL FORCES
EFFECT OF SOVIET CD/ CEP ON U.S. REQUIREMENTS	MORE OFFENSIVE FORCE, BUT SOVIET CD DEFEATS U.S. OBJECTIVE	MORE WEAPONS, LARGER AND MORE ENDURING STRATEGIC RESERVE FORCE (SRF) AND C ³ , BUT CD WEAKENS	PROBABLY THE SAME AS MILITARY POWER REQUIREMENTS, BUT BETTER INTELLIGENCE NEEDED	INCREASED NUMBERS, ACCURACY, FLEXIBILITY OF WEAPONS: C ³ WITH ENDURANCE; SUPPORT OF ALLIED FORCES TO PREVENT SOVIET VICTORY IN THEATERS

Figure 7 IMPLICATIONS OF SOVIET CD/CEP FOR ALTERNATIVE EMPHASES IN U.S. NUCLEAR TARGETING POLICY
(OBJECTIVES FOR EACH OPTION EMPHASIZED)

Defense programs. Emphasis on targeting Military Power would impose onerous requirements for increased numbers, accuracy and flexibility in the strategic offensive weapons, plus C³I with high endurance, and support of allied forces to prevent Soviet theater victories. Soviet passive defenses of military forces exacerbate these requirements.

D. Summary of Targeting Options

While we cannot, and should not, prescribe a specific mix of the four emphases analyzed, the foregoing analysis has led us to the following criteria for the evaluation of U.S. targeting options in the face of existing Soviet CD/CEP programs:

- Targeting should be addressed to Soviet valuation of targets in order to defeat Soviet strategic doctrine; mirror-imaging U.S. values and strategic doctrine may in the end prove self-defeating.
- In combination with other factors, passive defense measures are highly revealing of Soviet values. The priorities would seem to be the declared ones of Leadership, Military capabilities, Industry and general population, in that order.
- Soviet CD/CEP passive defense programs probably cannot by themselves (lacking effective ABM and/or ASW systems) give the Soviet Union decisive strategic superiority even where U.S. CD/CEP programs are lacking or ineffective; but such Soviet programs, when combined with a first-strike counterforce capability and a rapid and effective mobilization capability, could give the USSR a useable margin of superiority in deep crises that could effectively destroy the cohesion of U.S. alliances and force the United States to back down.
- The increasingly widespread view that the U.S. strategic umbrella is "leaky" and that the USSR is serious about preparing for the contingency of a nuclear war while the United States is not, encourages nuclear proliferation as well as "Finlandization" and accommodation to Soviet coercive diplomacy.
- Careful account must be taken of the interaction of potential destructive effects among the alternative targeting categories mentioned above.

- Targeting must take into account what is feasible as well as what is desirable.
- Enhanced destruction of more desirable targets can be undertaken through better intelligence vis-a-vis Soviet installations, their interrelationships, and their priorities in the Soviet hierarchy of values.
- In addition to a general upgrading of U.S. strategic posture, the tailoring of weapons systems against specific targets should be actively prosecuted.
- Calculations must be made with regard to a dynamic model of strategic exchange. Targeting must be mixed and cannot be fully optimized.
- Particularly when DE is not high, consideration ought to be given to the conservation of weapons and the maintenance of a strong SRF.
- The role of CD/CEP at all conflict levels--including potential diplomatic coercion--must be taken into account. Defense increases the uncertainty of the attacker (and counterattacker) and the self-confidence of the bargainer.

E. CD/CEP Options

From the indications of the impact of Soviet CD/CEP on U.S. targeting options brought out in the previous section, it is clear that U.S. CD/CEP programs could have a similar, though not always corresponding, effect on Soviet targeting options and effectiveness. One significant difference is that the U.S. targeting of Soviet leadership is largely negated by a combination of dispersal and sheltering of that leadership and lack of U.S. intelligence on the Soviet activities. U.S. continuity of government (COG) programs have not been developed to the point where they offer equal impediments to Soviet targeting. Proposals have been made, but not yet studied in sufficient depth, for COG programs that would offset the relative lack of ability in the U.S. open society to deny the Soviets far greater intelligence by providing some mix of fixed shelters and mobile facilities for U.S. leadership--in particular, the Presidential successors and support teams to enable them to function in the early trans-

PHILOSOPHY	METHOD	OUTCOMES AND OBJECTIVES
A. DISASTER, OR "NATURAL EVENT" Deterrence only: military C ³ protected but no endurance; Little COG protection. Little war mobilization capability - or only USSR has it	Minimum Preplanning Conventional war mobilization only Military command-control nonenduring Ad hoc survival period Military may seek to reconstitute government No war fighting--chaos	Outcomes War over? Clean up the mess? No more enemies? Postwar objectives (not realistic) Domestic - survive, recover Int'l - none, except recover at faster rate than USSR
B. MILITARY PLANNING ONLY Add: endurance to military C ³ ; some war mobilization and termination capability	Add: Improved, enduring military C ³ War mobilization, including some stockpiling, etc. Military management of survival period Some short-term war fighting	Outcomes Permanent military control? If war fighting, to what political ends? Postwar objectives: same as A but more realistic
C. NATIONAL ENTITY SURVIVAL Add: COG protection and endurance with civilian control of military at all times; war fighting and termination capability at all levels of attack; CD/CEP pre-war, trans-war, postwar.	Add: Civilian COG planning CD/CEP Mobilization planning and economic allocations to postwar military objectives Civilian control of military for survival aid, war fighting, escalation control, war termination	Outcomes Survival, reconstitution, recovery, postwar power all possible; postwar political ends possible Postwar objectives Domestic: survive, reconstitute constitutional democracy, recover socially, politically, and economically Int'l: a national security position, with allies and access to world's resources and markets, in an international system based on free nations.

Figure 8 THREE PHILOSOPHIES OF PREPARATION FOR SURVIVAL AND RECONSTITUTION PHASES BETWEEN INITIAL ATTACK AND RECOVERY

war survival period. The probable substitute for Soviet-type secrecy is the provision of many alternate sites, i.e., the analog of the missile "shell game" of multiple aim point systems. A summary of the options open to the United States, categorized by the three alternative philosophies offered in Figure 4, is presented in Figure 8, which completes the method and outcomes columns of Figure 4.

First, emphasis in CD/CEP must be on Survival and Reconstitution capabilities, not Recovery. As the kind and level of war scenario approaches the all-out C_3 described in Figure 3, above, the immediate needs of Survival must patently be met by local resources. Targets and regions may be isolated "islands" immediately after large attacks. They cannot wait for instructions and help from "outside," i.e., from the Federal Government.

It cannot be over-emphasized that the early Survival period is the most crucial phase of all. It has been widely held, and indeed forcefully argued, that in a large-scale nuclear war such activities as we have been discussing, and in fact all activities, will break down. The shock will be so great that anomie will replace organized society. Individual activity, when it is not simply panic and flight (sans destination), will be looting for food or goods (in the latter case, perhaps mindlessly at the time but ultimately a rational preparation for the barter stage to come). There may even be murder of perceived competitors for food, medicine, or simply assets.

We cannot know if this is true, but the history of other, albeit lesser, wars and disasters must have some relevance. And history does provide examples, if not a uniform pattern, of two things. First, catastrophies have been known to evoke incredible herorism, altruism and will to survive. One need only recall the case of the "900 Days" at Leningrad. Second, advance preparation, both mental and tangible, and continued leadership can improve the prospects of forestalling anarchy and of producing more heroes than cowards or criminals.

We put mental preparation first for the same reasons that military men emphasize morale. Soviet citizens are being fed civil defense manuals and training, plus anti-American propaganda. However tiresome this barrage may be, it must to some extent prepare Ivan Ivanovich to react obediently when he is brutally attacked by the Americans, who turn out to be as heartless as he had been told. In contrast, Americans have long been told that nuclear war is an unsurvivable hell. They have not been told that their government cares, nor shown that it cares enough to make visible preparations. They have not been assigned responsibilities.

CD/CEP should start, then, with mental preparation, also called education. This prior education must be supplemented by mental and physical preparations of the government itself to do what it can to ensure fast communication, to tell the people that they have a government and that the government cares, even before there is real information to convey.

The government must be prepared to give immediate evidence of authority-- not just police, but a national guard nationalized (by prior planning, i.e., doctrine) must give evidence of an intent to keep order, which is a precondition to successfully giving aid. Where the word is that the police or national guard have orders to shoot looters, looting is rare; where the police or military have been in sympathy with rioters, or have been intimidated, looting has been rampant. This has been seen recently in race riots; urban blackouts; partially evacuated scenes of natural disasters (and the fear of looting is one reason most such evacuations are partial, even when the disaster is not natural but an accident in a nuclear plant, as at Three Mile Island); incipient and actual revolutions; and in wars, where incentive or ability to control armies has varied widely. The Germans, Japanese and to a lesser extent the Soviets kept impressive order through most of World War II. Where undisciplined French civilians undertook their own evacuation plans before the German armies, they impeded

the very armies still attempting to help them--and also found themselves Stuka targets.¹

Again, we cannot know how well mental preparations, education, discipline, incentives, responsibilities, a leadership that seems to care--and also protective measures, stockpiling of food and medicine, etc.--will work, either in maintaining social cohesion or in limiting damage in nuclear war. But we can find evidence that all such steps have helped in historical cases. And we can infer with compelling logic that if they are not attempted, the situation will inevitably be worse than it would be otherwise, in all cases short of near total destruction (i.e., short of the final rise of the lower line in Figure 1).

The initial contributions of CD/CEP will be in education and preparation. Education means the development and inculcation of doctrinal reactions that will favor, not inhibit, Survival. Preparation refers to more direct measures that attempt to ensure that the workers and the resources most urgently needed in the Survival period will actually survive. This means emphasis on civil defense plans to protect fire fighters, police and other personnel essential to the maintenance of order and the rendering of many kinds of assistance to the citizenry, medical personnel, including paramedics, radiation monitors, etc., plus prestocked tools of their respective trades, from fire trucks to medicines.

These steps apply equally to populations in situ and in host areas for evacuees. Even if a large-scale evacuation is implemented, there will be people who have to remain in cities and others who remain because they think flight is unnecessary, useless, risky (looting), infeasible (e.g., because of age or health) or undesirable for idiosyncratic reasons (experience in non-nuclear emergencies has shown that some people will not leave their pets!).

¹ See Petty, et al, "Economic Recovery Following Disaster: A Selected Annotated Bibliography," R-2143-ARPA, RAND.

Such local self-help activities, sometimes described as the "bottom-up" approach to civil defense, are not competitive with, but rather complementary to "top down" measures of Federal (and in some cases, State) planning. In the first phases of Survival, the Federal role may be very small, but even so, a successful COG program may enable the surviving Chief Executive to contribute immeasurably to morale and the prevention of anomie at the local level by virtue of prompt, if rudimentary, communication (e.g., with surviving radios--hams and CBs) of the fact that there is a government, of the status of the war (to the extent that it is known), and of the possibility of aid being on its way in some reasonable time. As the Federal Government progresses with Reconstitution, its relative role will increase. It will presumably begin to assess nationwide damage and be able to communicate more fully about conditions and prospects, the course of the war, and efforts both to prevail and to terminate nuclear hostilities.

It has been suggested, not facetiously, that Soviet civil defense manuals and other training aids (slides, movies) should be translated and distributed in the United States. Without advocating this step, we can note that these Soviet materials have the virtue of being very comprehensive. They educate and prepare the population on many aspects of Survival--proper evacuation procedures, how to improvise shelters in many circumstances, how to build and stock permanent shelters when there is time, how to decontaminate after fallout, and so on. One important aspect is that the films show all the able-bodied as having a function and responsibility (firefighting, decontaminating, feeding others, cleaning, etc.), without belaboring the important point that responsibilities are excellent insurance against counter-productive activity.

Later stages of Survival, which might be called the Recuperation period, will involve emphasis on the reconstruction of all utilities--communication, transportation, power, water supply--the reestablishment of the adequate flow of food supplies, and the restarting of the production of essential goods and services. "Essential" may refer here more to

requirements for continued warfare, or potential warfare, than to the restoration of any but a truly minimum standard of living. The role of the Federal Government will increase in this phase, both for establishing requirements and for locating and redistributing stocks of scarce items.

In this phase, which may under some circumstances be quite prolonged, people will start worrying about the mundane questions of who will pay for what. Barter will be one of the first allocating mechanisms used at the local and even higher levels. The Government will have to move as rapidly as it can to establish maximum prices and ration quotas for essentials, starting with food, and the black market will once more demonstrate its capability for efficient allocation--not optimum, but efficient under the circumstances. To the extent that currency retains any perceived value, it will be used by those who have it to buy up supplies before the hoarders get there.

There will be awesome questions of how to reconstitute property rights, other than by barter and the frontier rule that possession is nine-tenths of the law. But most of these questions will have to be delayed for a time. The only immediate Government moves that will make sense are the closing of all (surviving) banks and a moratorium on debt service and foreclosures. Currency will rapidly become worthless, and the Government will have to exercise great restraint in the matter of attempting a currency reform (the issuance of a new currency). Done too precipitously, this can only lead to a new "runaway" inflation--and we do not mean "double-digit," unless an hour or a day is substituted for a year in the denominator. But a failed currency reform weakens the prospects for the success of the next one. Some flow of goods and services must be induced by a combination of appeals, compulsion, perceived common- and self-interest, barter, and acceptance of inefficiencies, before a new currency can receive sufficient confidence from the people to be accepted and used.

Again, the course of this phase is highly scenario-dependent. Will the war terminate (other than by complete defeat) in a way that makes people believe the active threat is truly over? Will there be viable third-country economies, and will this country have access to them? (Who controls the seas?) Will foreign credits become available (the leverage of large but relatively small amounts of Marshall Plan credits was remarkable--the Marshall Plan came in what is more properly called the Recovery period, but the less familiar "GARIOA" and UNRRA"¹ funds paved the way for them during the post-World War II recuperation phase)?

Restoring some flow of goods and services will be inordinately difficult. Hoarding will challenge even draconian Government measures--and will often win. But the economy will indeed have to live off inventories until production passes the rate of inventory consumption. When this point has been passed economy-wide, the transition to a "viable" economy can be said to have been reached--the transition from Survival/Recuperation to Recovery. It cannot be overemphasized that the time at which this point may be reached is largely determined by politico-military factors. Three simple cases in point:

- In West Germany (the U.S., British and French Zones) recuperation from WWII depended on the reversal of the Morgenthau Plan for reducing Germany to a permanently agricultural economy, the termination of the reparations plan, and a successful currency reform. The latter was attempted Germany-wide, on a quadripartite basis, and the Soviets twice sabotaged the plans by literally running their printing presses in the East Zone beyond the agreed quotas, insuring that Gresham's law would operate: "cheap money would drive out the good." It was the Western powers' decision to go it alone in June 1948 that precipitated the Berlin Blockade and the U.S.-organized airlift to counter it. Meanwhile, the tripartite currency reform was carried off successfully and the economy took off. "Nonexistent" inventories appeared out of nowhere; July industrial production was 20 percent above June, and August about 16 percent above July. The Wirtschaftswunder was born.

¹ GARIO: Government Assistance and Relief In Occupied Areas; UNRRA: United Nations Relief and Rehabilitation Agency.

- In East Germany, reparations were pursued relentlessly, requiring, as after World War I, funding out of current production, and recovery was deliberately delayed for many years, only really getting going after the Berlin Wall staunched the hemorrhage of people fleeing poverty more than oppression.
- In Japan, damage to the economy had been greater, but there was a single occupying power, determined within a year to promote recovery in order to relieve its own burdens and to create a democratic, nonmilitary power to replace the military regime in the most industrialized and dynamic power in the East.

In each case, it was military power and political intent that governed the start and early rate of recovery. The same was true for Germany after WWI.

No nations have experienced large-scale, two-sided nuclear war. Our ignorance of what it may be like is near-total. But the rules of the game are not necessarily all changed.¹ There is some point at which Survival and Recovery may not occur; Dark Ages have descended before. But if nuclear war can be terminated before that point is reached--and the incentives to deescalate appear a priori to be at least as powerful as the incentives to escalate--then history provides considerable evidence on the nature of the problem. We know a good deal about the requirements for Survival and Reconstitution that must precede Recovery. It seems clear that both military and civil preparations should be directed to the goals of making Survival and Recuperation feasible, to enable subsequent Recovery. This is not to deny the potential usefulness of planning, stockpiling, etc., to facilitate Recovery, but rather to emphasize that resources and effort can for the most part be better allocated to those standby laws, trained organizations, preparations, plans and stockpiles that will effectively aid Survival and Reconstitution, the preconditions of Recovery, as defined at the outset.

¹ Except that the nuclear part of the war may come so fast that many of the CD/CEP measures taken during WW II must be taken before WW III.

If the Recovery stage can be reached, the Federal role will be essential for the establishment and enforcement of production priorities, the restoration of maintenance of a viable currency, and innumerable other functions that will require central planning and administration in time of war and of Recovery as the final phase of war.

Given that the war is "over" and that Recovery has started in the sense that Survival and Reconstitution have been achieved, and economic "viability"--production exceeding inventory drawdown--has been reached, there is no question that the nation can recover, as noted above in Section I, Item E.

V CONCLUSION

The SALT II debate¹ is bringing the issues of the U.S.-Soviet strategic balance and U.S. preparedness back to the national consciousness. It is clear that the Soviet strategic superiority that appears imminent for the early 1980s will require many unilateral U.S. changes in both doctrine and force posture. Some of these changes must be quick fixes to the strategic offensive forces and the strategic defensive forces.

The future must see more attention to strategic defense, because the strategic offense is being limited in the SALT process:

- Soviet defenses can be designed to meet fixed (limited) U.S. offensive capabilities;
- U.S. cannot offset Soviet defenses with more offense and must design defense against the Soviet offense.

There are two views of nuclear war. The first is that the first strategic nuclear attack, even if limited, will be such a shock to the society that anomie and despair will take over and Reconstitution and Recovery will not be possible. The alternative view is that if you prepare properly, it is possible to Survive, Reconstitute, and Recover from limited and even quite large attacks. We cannot know, but it is quite possible that without preparation the first view is valid, perhaps even at quite low levels of nuclear attack.

The Soviet Union clearly takes the second view and has in fact been preparing for many years for the possibility of nuclear war, with the

¹

And, as this goes to press, the Iranian and Afghanistan crises.

objective of Survival, Reconstitution, and Recovery that includes the establishment of a satisfactory Soviet power position in the postwar world. These preparations have been very comprehensive, ranging from a doctrine, force posture and targeting policy for preemptive damage-limiting attack through all forms of defense, including

- Civil defense, with the highest priority on the preservation of leadership, from the top level (including military command) down through the regional and local party and governmental structures and management of key industrial establishments; second priority on the protection of key workers and plant and equipment in essential industries; and then the evacuation and fallout protection of the remainder of the population,
- Air defenses, R&D on ABM, antisatellite defenses,
- Maintenance of a war mobilization base and capability,
- Steady increase in non-strategic forces, in the recognition that nuclear war will not be conducted in isolation, in the form of one or a few strategic exchanges, and that post-war military power may control recovery patterns and political developments.

As a consequence of the above, the first recommendation is that the United States should adopt programs for the physical and psychological survival of its people and for the Survival and Reconstitution of its social and political system, beginning with the Presidency.

Such CD/CEP programs should be conducted in parallel and close coordination with improvement in the survivability of military C_3 and other military capabilities required for deliberate, selective and controlled response to a Soviet attack rather than the capability only for escalation to allout urban/industrial/population attack or for surrender.

In sum, CD/CEP could make a significant contribution to restoring the strategic balance and therefore provide a basis for U.S. confidence in a crisis and the expectation of Survival, Reconstitution and Recovery, should any but the most Draconian strategic nuclear war occur. Such confidence is the only possible basis on which U.S. leadership could have sufficient will,

and the support of U.S. allies, in a crisis to choose the risk of war over appeasement. Without the will to accept this risk, appeasement--a progressive phenomenon--will be inevitable.

There are many options for building a meaningful CD/CEP capability in this country. They must be studied in detail and in the context of U.S.-Soviet comparisons, before national choices are made. These choices will not be easy in a democracy that has little appetite for thinking about nuclear war or for accepting the constraints on personal choice that adequate preparations for credible deterrence or war entail.

The first step toward making these choices is a revision in U.S. objectives. Deterrence-only is not an adequate objective. There must be some national values, the preservation of which justify the risk of challenging the opponent in the first place. Otherwise, preemptive surrender will always preserve deterrence. Preservation of these national values is the political objective which justifies the effort, if deterrence fails, to Survive, Reconstitute and Recover in the full sense in which we defined these steps at the outset.

APPENDIX A

A DISCUSSION OF METHODOLOGY FOR STUDYING THE SURVIVAL OF, AND RECOVERY FROM, STRATEGIC NUCLEAR WAR

By Francis P. Hoeber

Note: This is drawn primarily from Informal Note SSC-IN-79-3 which was based on a presentation at an OJCS/SAGA Workshop on 23 May 1979 entitled "The Approach and Methodology for Gaining New Insight into Strategic Nuclear Survival," one of a series of workshops designed to aid the COPRA research program. It has benefited from the suggestions of several Workshop participants.

A. Introduction

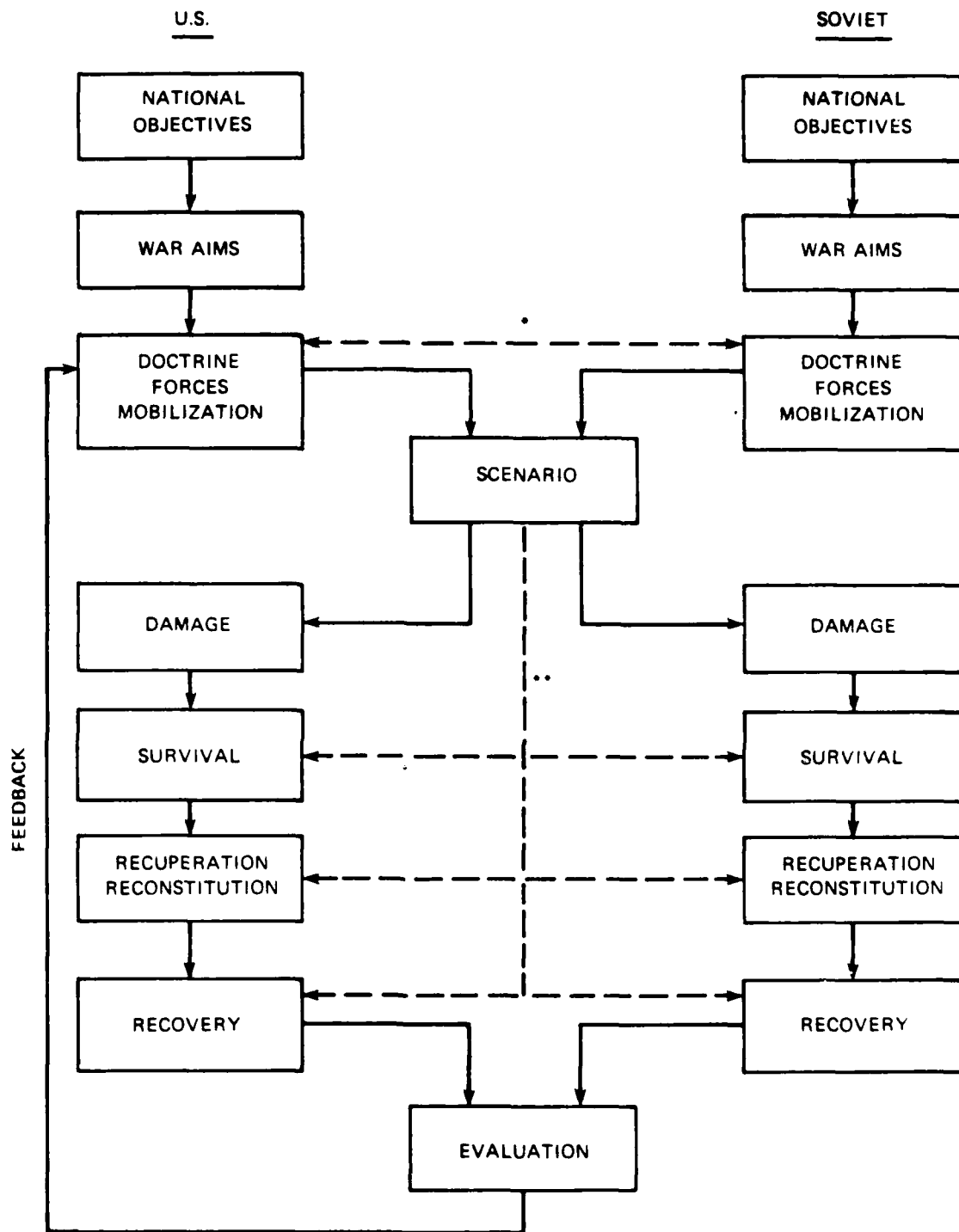
Recovery from strategic nuclear war, if it occurs, is but the last stage in a long and complex process. Figure 1 gives a simplified representation of some of the principal influences on, and stages of, this process.

Strategic nuclear war is little understood. It has, after all, never been experienced, and we cannot know if our limited understanding is at all correct. Nevertheless, the possibility of such war exists and questions are asked about whether we, or the Soviets, could survive and recover from such a catastrophe. Recovery, however, cannot be defined and analyzed without knowing the preconditions which determine whether it could even start and how it might proceed. In approaching the subject, therefore, we assume that our methodology must encompass the study of the whole process.

Analysis must start, then, with the national values and objectives, war aims, and doctrine of both sides, as shown in the first three pairs of boxes on the chart. These topics were extensively discussed in the March 21 Workshop on the Strategic Framework, chaired by R.B. Foster. The methodology underlying the findings of that workshop was not made explicit. It was clear from the presentations, however, that the methodology included:

For the Soviet Union

- Historical analysis
- Study of Soviet public and classified literature
- Study of intelligence, including: HUMINT and other direct evidence on doctrine; defenses, including especially passive defenses as indicators of Soviet value rankings; weapons characteristics; and military exercises
- Evaluation of consistency among the above.



* Possible long-term interaction after U.S. changes based on feedback.

** Potential protracted war would continue to affect Survival, Recuperation, Reconstitution and Recovery.

Figure 1 A METHODOLOGY FOR THE STUDY OF U.S./SOVIET NUCLEAR WAR

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SURVIVAL, RECONSTITUTION AND RECOVERY: U.S.-SOVIET ASYMMETRIES --ETC(U)
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For the United States

- History
- Declaratory policy during the nuclear age
- Actual targeting plans (SIOP)
- SALT policy (to date consistent with a doctrine of finite deterrence only); strategic forces, both offensive and defensive (active and passive).

It will be noted that the Workshop on the Strategic Framework considered forces as one element of intelligence for the derivation and analysis of doctrine. We have included forces and mobilization, or degree of readiness and planning, in the same box as doctrine on the chart, however, since one must consider doctrine, forces, and mobilization in analyzing possible employments of forces.

B. Scenarios

We come now to the actual scenario, or description, of how a nuclear war might be initiated and conducted. Note that we have used the word in the singular on the chart; the analysis that follows would have to be repeated for each alternative scenario. The first three boxes on the right hand side of the chart, the Soviet Objectives, War Aims, and Doctrine, Forces, and Mobilization, are essentially exogenous factors, or constraints, on the analysis. For the United States, they may be treated as parameters in the analysis and, indeed, as the chart suggests, feedback from the analysis might influence changes in U.S. doctrine and forces. It might be argued that some findings might also feed back to revision of U.S. war aims.

The possibility of long-term interactions between changes in doctrine and forces in the two countries, indicated by the dashed line, is noted for conceptual completeness but is considered here to be beyond

the scope and time frame of the analysis for which we are attempting to develop methodology. We may want to return to this question, however.

The scenarios adopted, and the analyses that flow from them, can test: (1) the effect of varying assumptions/conclusions about the Soviet Union; (2) the effects of changes in U.S. doctrine and policies; and (3) possible long-term interaction between (1) and (2).

Without discussing actual scenarios here, we would note that full exploration of the above points would require that scenarios take account of: conventional as well as strategic force employment;¹ strategic reserve forces; conventional reserve forces; and time-phasing of both nuclear and conventional force employments.

C. Damage Assessment

Computer models are probably essential to the calculation of damage because of the masses of data involved. Many "exchange models" are available for the measurement of damage to each side. However, there are several issues of importance to us in the selection of such models or the design of new ones, including:

- Figures of merit--It is not at all clear that existing models use criteria that are adequate to the analysis of the stages from survival through recovery.

¹

Conventional forces are relevant at every stage--targeting, intrawar deterrence and war termination, and recovery. In targeting, for example, our ability to target Soviet conventional forces, important as it may be, will be limited if those forces have been "dispersed forward" into, say, Eastern Europe, Western Europe, the Mideast, or China--even if we could locate and attack them we would be inhibited by the political undesirability of targeting allies, potential allies, or potential communist opponents of the Soviet Union. The importance of conventional forces in aiding one's own and inhibiting one's enemy's post-attack activities is noted elsewhere.

• Nuclear effects measures--Nuclear effects are so complex that one or two of the effects are usually used as proxy variables for all the rest. The first of these is usually blast effect, measured as peak over-pressure. The second is initial radiation, the two together often being used to indicate "prompt" fatalities and other damage. It is important for our analysis that delayed effects, notably fall-out, must also be taken into account. Other effects may also need to be studied for the adequate measurement of damage to assets other than people.

• Past models--In the derivation and evaluation of their results, past models have often tended to reflect the attitudes and preconceptions of their designers and users.¹ (See Section II, Item A, above).

It is well worth noting here John Coyle's trenchant observation that it may be equally important for the solution of the problems that follow, starting with the Survival phase, to assess what is undamaged in terms of areas, people, government and other institutions, communications, and plant.

D. Survival

The question of survival is one of the stages in greatest need of new methodology. A start has been made in studying the effects of civil defense preparations (broadly conceived to include all nonmilitary aspects of passive defense). It remains to be seen how much can be

¹ For extensive discussions of the relationships of individuals' views on nuclear war, the inevitability of escalation, the possibility of survival and recovery, and preferred U.S. doctrine, see R. B. Foster, Editor's Introduction, Comparative Strategy, Vol. 1. No. 3; R. B. Foster, F. P. Hoerber, and C. Movit, "Ideology and Economic Analysis: The Case of Soviet Civil Defense," Comparative Strategy, Vol. 1, No. 4; R. B. Foster, F. P. Hoerber, et al, "The Politico-Military Utility of Soviet CD/CEP Strategic Defense Systems and Their Significance for U.S. Nuclear Targeting Policy," SSC-TN-7536, SRI International for DNA (May 1979).

accomplished in the study of behavioral characteristics and the imagined behavior of people in the unprecedented world of nuclear war.¹

Historical analogies may be limited, but they are not necessarily irrelevant. They include examples of both panic and heroism in the face of catastrophe. Unfortunately, socio/political postulates and conclusions to date seem to reflect personal viewpoints, even more than in the case of damage assessments, noted above. Nuclear war is either unthinkable and unsurvivable, and will therefore lead to anomie among the survivors, or nuclear war is far tougher than all previous forms of warfare but can/may be survived with proper preparation and leadership and, in any event, the living must and will try to reorganize and recover.

Nevertheless, if we assume that the latter view may be valid, much can be done to study and evaluate the needs and possibilities of the survival phase, including:

- The primary physical requirements--fall-out detection, protection and decontamination; epidemic control; provision of drinking water, food, etc., and
- The psychological factors, including both planning and communication--pre-attack for education and especially postattack for allaying fear and panic and maintaining morale. The latter may be key: morale is self-possession, commitment, loyalty, and the will to live--

¹ Hiroshima and Nagasaki give us limited examples only, owing not just to the limited nature of the attacks but also to the fact that the population had no idea at the time of what had happened to them. In a future nuclear war, the populations involved will presumably, even in the absence of civil defense training programs, have a great deal of information, whether correct or not, and preconceived notions of what nuclear war is and what its survival would involve; this knowledge, the fears it engenders, and possibly also the knowledge of useful conduct it may give, could lead to very different conditions than those in the Japanese example.

probably importantly dependent on information, leadership, the establishment of hope, and the assignment of responsibilities.¹

E. Recuperation and Reconstitution

Recuperation and Reconstitution are included in the same box because they are overlapping extensions of the Survival phase. The first question is whether society can recuperate to the point of takeoff for recovery (the point at which economic production can supersede living off inventories, which will be the principal means of survival in the early phase). Some say this must take place in six to twelve months. The answer is a function of preparation, leadership, morale, the maintenance of law and order, and, if necessary, border defense. Again, the physical requirements may be understood but the soft behavioral variables have not yet been successfully modeled. Reconstitution is essentially a political question. It is closely related to the national objectives. For the Soviet Union this means the maintenance of Party control and the communist system; for the United States, the preservation of a Constitutional democracy. There will be more dependence on local responsibility, but there will also be nationally imposed marshall law and emergency controls. It is important that continuity of government (COG) programs provide that a legitimate executive be identified and, in a reasonable time, the Congress and the Supreme Court be reconstituted so that these emergency measures may be terminated in due course and the national entity is not transformed into some form of dictatorship or disunion, or even that a puppet government be established by the enemy.

1

For a review of attempts to bring history to bear on the understanding of the Survival phase as well as the following Recuperation, Reconstitution, and Recovery phases, see Geraldine Petty, Lilita Dzirkals, and Margaret Krahenbuhl, "Economic Recovery Following Disaster: A Selected, Annotated Bibliography," R-2143-ARPA, RAND (December 1977).

Other aspects of COG are, of course, also fundamental. While many normal Federal functions may of necessity, and perhaps preferably, be performed for some time at lower levels of government and by nongovernmental institutions, Federal leadership will be essential for civilian control of military decisionmaking and for negotiation with foreign governments, not least with the enemy on questions of war termination. As Admiral Russell had pointed out, the great centripetal force for a wounded, fragmented people has historically been the common defense against one or more external enemies.

The study of ways and means of providing survivable leadership, communications and data bases is straightforward, although complex; high-confidence solutions are not yet at hand. The soft variables--in this case, especially the responsiveness of the people to the surviving leadership--remain speculative.

F. Recovery

By recovery is usually meant economic Recovery--political and social Recovery are generally considered to be included in the previous stages. Recovery models to date have had several weaknesses.

1. Preconditions

The preconditions of Survival, Recuperation, and Reconstitution have been assumed away. Economic Recovery has been initiated by some form of spontaneous parthenogenesis independent of any political or social preparation, or even of such economic preconditions as the establishment of some form of viable currency and financial arrangements.

2. Dynamics

Wartime and post-war dynamics are not in the data bases on which the models are constructed, and indeed, these dynamics are almost

impossible to predict. Models may quite adequately handle changes in final demand, but they have trouble with the input-output coefficients, that is, the requirements of each kind of goods and services for other goods and services. Substitution is the most commonly recognized of these factors that are so radically accelerated in times of emergency. Substitution should be considered, however, as a subset of a larger concept of conservation measures that includes:

- Simplifying designs and numbers of models
- Cutting the weight of materials, e.g., by making lighter bases for machinery
- Increasing utilization of scrap--which will be in abundance in a post-attack situation
- Substitution of materials, including development of new ones
- Using ingenuity!

3. Criteria

There is difficulty in defining the proper figure of merit. Percent of prewar output is frequently suggested. Is it relevant? Surely, post-attack output will have a drastically altered pattern (because of both damage patterns and essential and stringent government allocation and control). As James Pettee has noted, we are not dealing with the normal phenomenon of marginal changes over time, but with real zero-based budgeting! (Cf. above comments on the dynamics of input-output coefficients.) But if a comparison with prewar is attempted--and it is virtually human nature to want to do so--the question arises, what weights should be used for the index? Prewar price weights do not seem appropriate in the light of the radical changes in the composition of output and in relative prices that will take place. Using prewar weights will also probably tend to underestimate recovery. On the other hand, current price weights will exaggerate recovery.

Per capita output, or GNP, is a dubious measure for several reasons. First, post-attack output requirements--heavy defense expenditures, for example--may not be related to numbers of survivors. Moreover, one faces the anomalous result that the heavier the casualties of general population in proportion to workers, the more rapid the per capita recovery will be.

One criterion for recovery will be essential: whatever the requirements for essential civilian support, defense efforts, and maintenance of capital, the economy must generate in addition a surplus for net capital formation if sustained growth and rebuilding is to be achieved. The substitution of labor for capital will be important in the early phases, but the proper productivity rates to be assumed are not at all clear.

4. Military Influence

It is generally necessary to treat as exogenous variables the effects of military power on production, e.g., the ability of the Soviet Navy to interdict U.S. imports and the Soviet ability to exploit East and West European resources.

G. Evaluation

Finally, the most important step in the methodology appears to be the evaluation of outcomes and formulation of feedback to U.S. doctrine and force structure. It is here that the payoff will be realized from the ability to measure sensitivities to changes in controllable variables, including simultaneous changes in interacting variables.

H. Some General Comments

The basic methodology proposed here is the systematic pursuit of the analysis of the elements in the descriptive schema in our chart, with

study, thinking, and imagination applied at each stage. What is not fully resolved is the contribution that may be made by formal modeling methodology to the analysis of the survival, recuperation, reconstitution, and recovery stages.

Our overall scheme is both a model and a hierarchy of models. One cannot conceptualize or analyze without a model, explicit or implicit. Models (in military applications) run a wide gamut from broad concepts through equations, computer optimizations and simulations, games, field exercises, to small wars. The last are really the best--or at least the most convincing--although even in this case people sometimes extrapolate too far. In any event, no one seems to want to try a small nuclear war, so we are forced to extrapolate from fragmentary evidence and an oversupply of opinion.

Questions of Survival and Recovery--and decisionmakers concerned with them--cry out for quantification. In principle, the whole process of nuclear war could be put in one simulation, or, more likely, in a hierarchy of simulations or of simulations and other models, e.g., input-output, linear programming, and other optimization models. In particular, application and expansion of the system dynamics simulation approach of J. Forrester has been proposed. The ability of this approach adequately to introduce and test the soft variables referred to a number of times above remains to be demonstrated.¹

¹

Considerable, promising work on this problem is going on, in particular in System Dynamics simulations based on the work started 20 years ago by Jay Forrester. Essentially, the approach is to include in the simulation "subjective variables" (cf. Bayesian statistics). Such variables may be quantified on the basis of the expectations and intuitions of experts. The Delphi technique is one methodology for doing this. Ray Schreckengost has submitted some separate materials on this approach and its applications in intelligence.

What also remains to be demonstrated is man's ability fully to analyze, absorb, and utilize the output of system dynamics or other highly complex situations. Models using today's (let alone tomorrow's) computers, with their high data processing rates, almost limitless virtual memories, and insatiable appetites for numbers of variables, may outrun our absorptive capacity.

Computer models have long been popular in the analysis of survival and recovery (and also of the nuclear exchanges and damage assessments). The results of these have not in the past been too convincing.¹ But these results continue to be used, for the same reason that drunks continue to look for car keys under street lights rather than where they lost them.

I. Conclusion

The following comments are offered in the hope of conveying a realistic picture of the problems facing us, without discouraging any members of the COPRA team or the defense community from continued efforts to improve the state of the art in this vital area.

- Current and foreseeable models cannot predict:

- Absolute outcomes, in terms of fatalities, casualties, plant damage, or any other measures with any determinable precision or accuracy
- Absolute recovery rates, in terms of time to get somewhere or other, or how much sooner one side gets there than the other, or even whether the preconditions for the initiation of recovery occur.

¹ See Howard M. Berger, "Critical Review of Studies of Survival and Recovery after a Large-Scale Nuclear Attack," R&D Associates for Defense Nuclear Agency (December 1978).

- However, models may predict:

Direction and degree of change in outcomes and in recovery start times and rates resulting from exogenous scenario variations (changes in enemy policies and actions) and from U.S. policy changes in:

- Plans (military and civil), force structure, passive defenses, and force employments (targeting, timing, withheld reserves, etc.)
- Survival, recuperation, reconstitution, and recovery policies.

- Good models teach.

In the present case, if we can construct and exercise models, including games, that adequately measure sensitivities touched on above, then we will learn things that will contribute to the COPRA and SAGA purpose of offering indicators for policy changes in force procurement, doctrine, and plans.

APPENDIX B

WORKSHOP ON THE STRATEGIC SIGNIFICANCE OF PREPAREDNESS FOR SURVIVAL AND RECONSTITUTION (21 August 1979)

1. *Minutes*
2. *Charts*
3. *List of Attendees*

By: Richard B. Foster
Francis P. Hoeber
Jane R. Misheloff (Workshop Secretary)

Note: This workshop was held as part of SRI Project 7933 and this project benefitted greatly from the contributions of the participants at the Workshop.

Minutes of SRI/SSC and DCPA CD/CEP Workshop

August 21, 1979

A. Introduction

On August 21, 1979 a workshop was held at SRI-Washington facilities entitled "The Strategic Significance of Preparedness for Survival and Reconstruction" under the direction of Richard B. Foster, Director, Strategic Studies Center, SRI-Washington. (List of attendees attached). This workshop was held under SRI Project 7933, a study for DCPA, "Reconstitution and Recovery: U.S.-Soviet Asymmetries and U.S. Policy Options." The study is monitored for DCPA by George Divine, Project Officer.

Mr. Foster opened the workshop by introducing Frank Hoeber as the co-author of the study. He also indicated to the attendees that Ms. Jane Misheloff of the SSC would be taking the workshop notes. The informality of the workshop was stressed as well as its unclassified security classification.

B. DCPA Interests: Mr. Divine

Mr. George Divine, Project Monitor from DCPA, then outlined the place of this study in the DCPA schema. Divine discussed the difficulty of taking separate studies and integrating them into a policy format which would be the best end product for DCPA decision makers. It is the job of DCPA to weave various studies now underway into such a policy format. Other studies outlined included these examples: (1) Pugh-Roberts Associates, Inc., a dynamic economic model of the post-attack environment and the role of the Federal Government in it; (2) Systems Planning Corporation, Soviet mobilization capabilities; and (3) SRI, techniques for modeling economic recovery and the problems of managing resources.

C. SRI Presentation: Mr. Foster

Mr. Foster began his presentation by stressing that we must begin to define and relate reconstitution and recovery to the design of the nuclear war, and must search for criteria against which to measure survival, reconstitution, and recovery within the parameters of war outcomes--not parametric attacks. We cannot generalize that the U.S. would recover economically at a faster rate than the USSR. Recovery depends upon survivability and recuperation of both nations, which in turn depend upon the design of the war and upon the nature, quality, and extent of the CD/CEP programs. In the early 1980s, the USSR have designed their forces to retain the strategic initiative, including a growing strategic first-strike capability. During the same period, one of the objectives of the U.S. deterrent posture and of SALT I and II arms control agreements, i.e., that there be no advantage to either side in striking first, appears to be fading. The situation is compounded by the lack of U.S. continental defenses--both active and passive. There is no clear-cut policy for U.S. "national entity survival"; the Soviet Union does have such a policy. In the light of these factors, the question of how much civil defense cannot be answered. There is also uncertainty about what kind of civil defense is needed and the priorities to achieve the programs. In a word, there is no comprehensive plan. The Soviets have apparently answered these questions, they have a plan, and are proceeding apace with program implementation. Current U.S. interest in civil defense comes from this growing Soviet civil defense program. This leads to the question, does unilateral Soviet civil defense destabilize strategic deterrence? If so, how should we respond? Since civil defense measures generally do not become obsolete as fast as high technology weaponry, the Soviet CD program will not become obsolete as rapidly as, for example, an ABM system. There are strong indications that Soviet civil defense expenditures are growing each year, according to the CIA.

Mr. Foster then made a presentation from the charts (attached), copies of which were furnished the attendees. The briefing started with a

definition of the key concepts of civil defense (Chart 1). This is the first step in establishing a U.S. civil defense plan, because unless we have defined these terms we have no clear-cut way of stating our civil defense requirements, nor can we assess the strategic importance of Soviet civil defenses in a post-attack recovery role. Following the definition of key concepts, Mr. Foster explained the charts and figures contained in the handout. Only Mr. Foster's comments which are in addition to the ones on the charts are listed below:

1. Definition of Key Concepts

a. Survival and Reconstitution

- People would not be likely to be motivated to make the transition from the survival phase to the reconstitution phase to the recovery phase if they expected another nuclear weapon would be dropped on them; in other words, they need word from the President that the war is over.

b. Continuity of Government (COG)

- Presidential successor teams are necessary, possibly of an initial size not to exceed ten persons.
- There has been little work done in recent years to ensure the legitimacy of the Presidential successor for the COG role.

c. CD/CEP

- We cannot look separately at CD and CEP; we must use the combination (including mobilization and stockpiling) for a total definition of passive defense.

d. Recovery

- We need a plan to make the transition from survival "islands" to reconstitution of the nation so that we do not remain a group of defenseless "islands."
- Not much recent attention has been paid to U.S. intra-national economic interdependence (within the U.S.), while great emphasis has been placed on international economic interdependence.

2. Effect of Beliefs on Estimates of Nuclear War Outcome (Chart 2)

- Because of U.S.-Soviet cultural, social, and ideological differences it is impossible to attribute a U.S. belief to the Soviet Union. In the Soviet belief system the lower line is likely (assured survival and recovery) while the current U.S. belief system tends to the top line (Assured Destruction).
- These belief systems become central to war planning in both nations; the balance of defense and offense, of defensive weapons and passive defenses with offensive weapons, varies according to these beliefs. The Soviets plan a balanced offense and defense; the U.S. plans an offense-only offensive retaliatory force.

3. U.S./USSR Deterrence Concepts (Chart 3)

- USSR believes in "victory." and CD/CEP has positive political and strategic utility; U.S. believes in deterrence only through "assured destruction" and CD/CEP has negative political and strategic utility (it's destabilizing).

4. Stages of Nuclear War (Chart 7)

- An all-out attack on cities by either side with all available weapons would make it impossible for survival, reconstitution, and recovery to occur; but no such totally irrational (because suicidal) war would be designed by either the U.S. or the USSR.

- Can nuclear war be terminated short of all-out attacks on urban areas? The answer is embedded in the belief system outlined earlier.
- U.S.-Soviet war-termination negotiations would continue during a "staged war" and thus might facilitate recovery; Soviets appear to have already taken this into account in their CD/CEP program. But such termination might also include surrender if one side ended the counterforce stages with a large reserve force and the other side had little if any reserves left.

5. Policy Options for U.S. to Offset Soviet CD/CEP (Chart 10)

- If we decide we cannot overcome Soviet civil defense by U.S. offenses alone, we will begin to look more closely at a serious U.S. CD/CEP program. This will occur more rapidly when we realize that SALT II limits the additions of U.S. strategic offensive weapons to overcome Soviet CD/CEP measures. The Soviets appear to have reached the reciprocal perception and to be designing defenses against a SALT-constrained U.S. offense.

6. "Three Philosophies" (Charts 11 and 16)

- Military planning for a survivable and enduring C³ system would be only a way station for the COG requirement for national entity survival.
- Stockpiling has been for conventional wars only; we should also stockpile for the recovery, reconstitution, and survival phases of nuclear war.

D. Comments and Discussion

Before breaking for lunch, Mr. Foster asked for comments from two attendees who had previously informed him that they had to miss the afternoon session because of previous engagements: Dr. Eugene Durbin, of the Office of Net Assessment, DoD; and Maj. General Leslie W. Bray of TASC.

Dr. Durbin made two points: (1) there is a need to better understand the nature of nuclear conflict and to bring this understanding to the American people; and (2) in what ways would the government operate differently if we took a broader view of the kinds of nuclear conflict we might face.

While most of the American population and government policymakers perceive the adverse trends (U.S. vis-a-vis the USSR) that are occurring, they have not caught the full flavor of what is happening. The United States is no longer the dominant military power in the world. Our economy is slipping, e.g., Japan and the Federal Republic of Germany are pushing ahead of us in productivity and technological advance. We no longer exert the influence we once did; there is more competition of all forms, especially military competition from the Soviet Union. This competition derives from many dimensions of national power; it is coercive use of national power by one country to affect all dimensions of another country's well being. Someday, out of this competition and coercion conflict may erupt, and nuclear weapons may be used. However, just because nuclear weapons are used, the competition will not stop, because the nations involved and the national objectives will not be totally transformed. Because the competition may well continue, the U.S. will not be left alone to recover. In such a post-attack atmosphere of hostility and threat to the U.S., we may not be able to return to a free market economy or to continue to be able to stockpile, or to mobilize in the traditional fashion of previous wars.

To prepare for such situations, we must think of different kinds of war in which nuclear weapons are used. Our current spectrum is still too stylized and narrow. We should broaden our scenarios and our view of what crises, what conflicts, and what terminations are possible, and about what that suggests for our civil planning.

Mr. Foster replied to Dr. Durbin that he concurred that we must broaden our range of nuclear conflicts, and this has already been done

in the report in a broad generalized way. One of the issues that arises from the changing world and the loss of U.S. dominance is the fact that the U.S. is losing control of escalation. As this happens, the U.S. alliance system is in trouble. This issue (among others) derives from the changing strategic nuclear balance, and the potential of nuclear conflict. This potential is not yet clear to the Federal bureaucracy and to the Congress; after the leadership is informed, they can inform the people.

Frank Hoeber asked why it wouldn't be possible to return to a constitutional government. Temporary war powers are not incompatible with the resumption of civil government. Also, is it unreasonable to think that escalation can be controlled, so that there need be no automatic escalation to Armageddon?

Dr. Durbin added that Michael Howard, in his Foreign Affairs article "The Forgotten Dimensions of Strategy," stressed that socio-political cohesion must be taken into account, since this would significantly affect the measures the U.S. could take after nuclear war.

Mr. Foster pointed out that the primary ways of taking the expectations of the public into account are the legitimacy of any war's political aims, the legitimacy of the President's mandate, and his behavior in crisis and war.

General Bray was worried by the possible occurrence of repeated nuclear attacks and the effects on recovery. "Recovery" may not be synonymous with "peacetime"; a recovery period may be just another phase of the war, giving new targets. We must try to identify the things needed for an extended attack period instead of rebuilding new targets.

In this regard, if the enemy is left with a large reserve force and the U.S. has virtually none, this would put us in a bad position, said Mr. Foster. If we are to have symmetry of outcomes, then we must have symmetry of threats (nuclear and conventional) in each phase of the war.

The worst possible outcomes would be for the U.S. forces to be depleted while the Soviets have a large reserve, said General Bray. There has been a renewed interest in the Presidential successor programs for continuity of government as well as continuity of military command. We must ask if there are absolutely minimum essential things a President must do during a limited attack. Does such an attack pose severe requirements on Presidential successor programs? How do we keep Presidential successors up to date on what has happened? We need to ensure Presidential survival during the initial post-attack state; we need a government (a legitimate successor) which can negotiate war termination.

George Divine reminded the group of the SAGA program for COPRA studies of limited conflicts. Frank Hoeber commented that the Soviets are on record as saying, "the winner is the one with the last reserves." Current SALT II agreements may mean that having the last reserves will not happen to us after a Soviet first counterforce strike.

Do we need a strategic warning system for survival of the Presidential successor, asked General Bray.

We do not need to cover every boundary situation, said Mr. Foster. We cannot design a feasible program for every boundary condition. We have no feasible program today, because we have already established an unfeasible boundary requirement. A successful program is, however, feasible for a less-than-total Soviet attack on all U.S. urban targets.

Mr. Divine added that a lower boundary condition is more likely that resulting from terrorism. There are task groups now looking at the problem of nuclear terrorism.

General Bray continued, concerning COG (per Chart 16), that the assumption that the central government will direct everything from the top down may change. Initial survival may have to be made from "islands." This is the bottom up vs. the top down approach. We need an examination

of a post-attack recovery plan that follows from an initially decentralized survival period. CD/CEP recovery plans for allies are also important.

A CD plan must also include the stockpiling of strategic critical materials. A large scale conventional war makes the most demands on the economy and stockpiles; that same philosophy makes it a good idea to "stockpile for recovery."

General Bray concluded that we have always presumed that the Soviets would initially launch a counterforce strike. For limited nuclear war we have little basis to think that the Soviets would launch a counterforce strike when there are other targets that may be more important to achieve their objectives.

The afternoon session began with a discussion about communications. Frank Hoeber thought that during the immediate survival phase, calling in the National Guard to ensure order was equally important to continuity of Federal government. It may help if there is a restorable line of communications which could be started locally.

Lyn Edwards, the AT&T representative, added that it was possible to have a number of "islands" in which local telephone communications were good and easily restored but not readily connected to a long-line network.

Frank Hoeber stated that we don't have a real choice between a "bottom up" or a "top down" survival plan; some acts of survival cannot be centralized.

A few critical functions have to be centralized, stated Mr. Foster, such as Presidential communications to all the surviving population (radio, etc.). The President doesn't need detailed information fed back in during this period. While the survival period will have to be decentralized, we have to find out the requirements for the minimum central information to the local survivors, such as "the war is over - come out

of shelter" - or the opposite.

Mr. Edwards informed the workshop that the Bell system does have emergency preparedness plans. Emergency centers around the country would collect local information and report it back. However, these locations could also be targeted. As damage would become more severe, it's impossible to predict a restoration rate or level. No government agency seems to know how much time would be needed to restore service.

The problem in the Pennsylvania floods, interjected Mr. Divine, was not with a central restoration of service, because a mobile unit was sent in right away. The problem was at the local level getting hooked up to the system to restore the network.

Mrs. Greene suggested that if we want to avoid overloading communications networks, we could have a set of pre-planned directives. We can look back over the years to see how we would have acted in a survival situation without the benefit of present-day communications technology.

Mr. Foster added that we must make sure there is a federalized National Guard so there are no problems in the local community as to who's in charge. The social/political breakdown of society as a self-fulfilling prophecy must be avoided. This must be countered by standby authority and standby laws. Minimum commands can be doctrinal in origin.

Government communications channels out to the people are important (as shown in a 1962 study). People want to be part of a group. It does not take much to give people social/political identity; they will do a lot more if motivated by social and political values.

Frank Hoeber stated that if there is an ongoing war, then there would be a reason for doing things beyond mere survival; international alliances and a new cohesion may be created.

Mrs. Greene raised the point that an enemy objective is to attack the national will.

Mr. Foster responded that one of the key requirements of the President's job as Chief Executive is to keep the national will alive.

Temporary military management of survivors would help do this, added Mrs. Green. Concerning Gene Durbin's comments on a public relations campaign to get facts before the public, the concept of deterrence is natural and appealing because it is already understood. Steady planning is more effective than crisis management. It could be destabilizing to start CD planning and execution after a crisis is under way.

Dr. David W. Peterson suggested that if we put ourselves into Soviet shoes, things would look strange. The U.S. is an isolated island, while the Soviet Union is surrounded by medium-sized countries. If there were a war between two big powers, the Soviets would be surrounded by enemies which would fight.

Mr. Foster stated that in recent years there has been a lot of study of Soviet theater forces. The Soviets have upgraded their army, air force, and missile force against theater "enemies." The Soviet concept of general war is based on the objective of destroying the enemy's forces--not his country: in Europe, it is to disarm, sieze, and occupy a relatively intact Western Europe under a policy of restraint to limit collateral damage to population and industry from nuclear weapons. Attacks on the U.S. would be coordinated with attacks on other theater fronts. The Soviets have superior combined arms forces on their borders in order to assure victory in each theater.

Dr. Peterson asked if the border forces are vulnerable. Mr. Foster replied that they have peculiar vulnerabilities. The U.S. nuclear targeting studies showed how we could make a shift from the emphasis on population destruction to defeat of these Soviet theater forces.

However, when these forces are "dispersed forward," they make themselves less vulnerable; how can we attack them after they "disperse forward" into other countries, asked Frank Hoeber.

The Soviets (said Mr. Foster) believe in wartime mobilization, and it would be easier to locate and target their reserve stocks and forces than the forward mobile forces. Conversely, U.S. mobilization in a conventional war would make us more targetable for the Soviets in the event of escalation to nuclear war.

Roger Sullivan of SPC raised the theory of civil defense as an "insurance policy" rather than stressing its value as a deterrent. He also asked if Soviet civil defenses can be overcome by retargeting. He went on to say that this would depend on what we want to target and its value to us. We should not bother retargeting if the Soviets are evacuating unskilled civilians.

A question was raised as to how we can convince people to spend money on civil defense. Frank Hoeber answered that the problem is not primarily with the American people, but is first of all with the Hill.

Dr. Sullivan added that in recent polls, 95 percent of those polled indicated they wanted as much civil defense as the Russians.

One form of civil defense that could pay for itself is to prepare by rehearsing for it, e.g., Three Mile Island.

Frank Hoeber pointed out that everyone took a negative view of the Three Mile Island incident. We should note that a "nuclear disaster" is said to have occurred and people survived--no one was killed, the population was not destroyed or injured.

Scott Payne of Systems Planning Corporation requested clarification from Mr. Foster concerning the purpose of the study and workshop. Mr.

Foster replied that the main thread was to summarize our report and to let people know what we are doing under our DCPA contract. We were asked by Mr. Divine to also present a set of ideas, concepts, and relationships which might relate to other work in progress by other DCPA contractors. Dr. Payne also raised the question of political competition, diplomacy, and the awareness of diplomacy. Frank Hoeber answered that in the survival and reconstitution periods, these functions would be accomplished by the President as Head of State.

Dr. Leonard Sullivan then stated he could not track between the title on the first page and the last chart (Three Philosophies). He thought that the answer to the question "how do we get people to fund civil defense" should come out of this study. Mr. Foster replied that we are doing research on defining and analyzing alternative philosophies for the survival and reconstitution periods as they affect U.S. postwar objectives. Dr. Sullivan assured Mr. Foster he knew what we were driving at, but that we all needed to "expand the rationale for preparedness and civil defense. Our study should draw out the benefits of national entity survival and relate it to postwar objectives.

Mr. Foster mentioned that right now money is being put into Military Planning for C³, which has tended to separate the military and civil (COG) roles of the President, resulting in an unbalanced national program.

Dr. Sullivan countered by saying that "National Entity Survival" may not be a viable "first outcome" of the survival period following nuclear attack. The survival of a region of the nation--an "island"--may be more important. It would not sell to say to the American people that the "U.S. regulatory system" must be saved before their own skins. On the other hand, can the winner really impose anything? Sometimes surrender doesn't matter.

Mr. Foster stated that a strong civil defense/civil emergency planning (CD/CEP) program will come into being if it is coordinated with

military planning and was treated as a strategic requirement for deterrence. First we have to start with the idea of a rationally-designed nuclear war in order to clarify the requirements for civil defense. We must remember that civil defense is a wartime activity. You need good military planning to save your own population; strong military planning will lead to a strong CD/CEP program with a COG component. The significance of a National Entity Survival objective is that it makes military planning feasible and useful for postwar objectives.

Dr. John Eley of FEMA thought we may be closer to the bottom of the "Three Philosophies" chart (No. 16) than we think. We may not be there yet, but there is movement in that direction. Solutions come when people accept the doctrine that they "ought to count for something strategic." But what kind of programs can you recommend for greater survivability of the economic output? What programs will support "the doctrine"? We still put too much emphasis on winning doctrinal arguments and too little on programmable outcomes.

Mr. Divine interjected that from time to time we have had many programs, but those changing programs resulted from our changing approaches to current events. However, all the time we have lacked a comprehensive plan which would combine program and doctrine, and that's what we're trying to put together now.

Dr. Eley also stated that there might be a way for the Federal government to respond to Soviet CD/CEP programs and capabilities by convincing state and local communities to cooperate with the national Government in a "bottom up" solution. We have then to translate these local needs and plans into programs.

Ms. Elderkin of DCPA added that state and local government have said that if they are to have civil defense programs, the Federal government must fund them. She went on to discuss the decentralized management probable in the survival period. There would be localized survival

teams and organizations which would have maximum activity immediately after the initial attacks. On the national level there would be centralized direction of warning and alerting the population and providing for continuous control of the war and its termination. Initially there would be minimum communications between the local "survival islands" and the President's activity. In the reconstitution phase, the restoration of communications from local to the national, centralized command-control would occur. But each survival "island" cannot take on all external enemies and act independently; hence, regrouping them in a national entity should be a part of our national entity survival planning. In this view, survival is "bottoms up," but recuperation is bringing the nation all back together again. In order to do this, we need a strong civil defense plan.

We cannot substitute offense for defense forever, added Mr. Foster.

Colonel Caruso of the Industrial College of the Armed Forces (ICAF) asked about nuclear poisoning of the atmosphere; what has happened to this issue?

It was decided to pass over this topic because of its classified nature.

Jerry Strobe of the Center for Planning and Research raised again the question: is civil defense good "insurance"; or does it have any strategic utility?

Mr. Foster responded that civil defense is an integral part of any strategic war fighting and war termination posture; civil defense changes the war outcome in significant ways.

Colonel Leo Panier of ICAF informed the workshop that they do some resource management studies at ICAF. They have also done a defense management analysis and an industrial preparedness planning briefing. These briefings were year-long projects prepared by their students and

eventually written up into papers. Colonel Panier asked the group to feel free to suggest subjects to him for his students. He then inquired if the absence of biological and chemical warfare in a first-strike scenario had been consciously omitted from the discussion. Mr. Divine answered "yes" because of the classified nature of the subject and because of client instructions to SRI. However, after the initial strategic ballistic missile strike phase of war, when the Soviets are free to roam at will in aircraft, these manned aircraft could be effective in carrying and delivering chemical weapons. The Russians might be able to take certain strategic U.S. targets intact with the use of chemicals.

Colonel Panier said that he thought taxpayers would like to see deterrence and survival of government coupled with civil defense. We need a "resource model" showing that the U.S. is capable of survival after a nuclear war.

Frank Hoerber added that the most convincing deterrent is one that is credible to friend and foe alike, and that nothing invites a war more than weakness. The strongest deterrent results from a good balance of offense and defense. Hence, civil defense has to be made an integral part of our deterrence posture. Dr. Sullivan stated here that these comments would be a welcome addition to the last chart.

Major General Triantafellu of Calspan agreed with Dr. Sullivan that the study has some tracking problems. He also added that "defense" measures have a better sound than "offensive" ones. With modern technology, we may be able to achieve a more balanced offense and defense--our current posture is all offense.

He was concerned about the importance stressed in "B. Military Planning Only" in the Three Philosophies chart (16) for fear of a military autocracy arising. He suggested that maybe we could

"gray into" the military control phase and "gray out" of it. The report itself needs a statement of methodology.

Lt. Colonel Thomas of DNA thought that the study needed a statement of the "threat" in order to increase Congressional and public acceptance. People need to see a "threat." He does not see this being accomplished here or any funds coming from Congress on the basis of current threats.

A national military C³ study is now going on. One problem considered in this study showed that the NCA needed not only release but recall capabilities. However, the C³ system to recall a B-52 over the Ukraine might cost two times the U.S. GNP. As for legitimacy of military conduct of the war, we must remember that the military is still responsible to civilian control. Colonel Thomas added that:

--The word "preparedness" needs to be more closely defined.

--A parallel study is needed to show how Soviet civil defense weaknesses could be exploited.

Dr. Howard Berger stated that with regard to a previous remark about stockpiling for survival, the present stockpile covers nuclear war as well as conventional. However, there is no official concept of stockpiling for survival. We need to broaden the stockpile to include the means of production (work in process, for example), as well as finished goods. We also need an operational definition of "political viability." How do you know when you have political (social) viability?

That's why we need a political concept of "national entity survival," responded Mr. Foster, because we don't know how to quantify a viable political system. One must maintain public order within a legitimate political system to ensure the social order that is a necessary precondition for a viable economy. Iran is a current example of a state with money and resources, but with no viable political order--and thus, no viable economy.

Dr. Berger also questioned that military capabilities are necessary pre-conditions for achieving realistic objectives. Do we have the military capabilities to reach the objectives of Survival, Recuperation, and Recovery?

Mr. Foster referred to Chart 13, "Impact of Adding Options on Opponent's Uncertainty of Outcomes," and pointed out that, while the Soviets were achieving these capabilities, we have only partial capabilities, and retargeting existing U.S. offensive systems has limited utility.

Dr. Berger stated that it isn't the Soviet threat which dominates U.S. decision making--it's the domestic political-economic situation. There are other things in the economy which need money. We believe that we don't have to be prepared to fight a nuclear war; we merely change our tactics to adapt to the changing situation. In this environment, it's hard to see what the influence of military power is. We have no idea what nuclear superiority can buy.

Mr. Foster said that it is hard to "measure" influence, but one can note trends. The Japanese are very sensitive to Soviet coercion, for instance.

Dr. Berger said that it is frustrating to justify a "threat" by comparing Soviet defense expenditures with U.S. defense expenditures. We need to emphasize how to solve problems posed by Soviet military forces.

Dr. Berger urged use of the argument that "CD is insurance" rather than the argument that "CD is strategic requirement," because the insurance argument would be "bought" by a wider spectrum of policy makers (such as some analysts in ACDA). Dr. Berger then commented that there should be more preplanning for the decentralized survival phase.

Mr. McNeese of FEMA said that he was gratified to see such an interest in COG, particularly in the mobilization phase. He was also

gratified to see a growing realization in the military that they need civilians and a legitimate Presidential successor. At present there is White House and NSC interest in COG. FEMA is looking at old beliefs and recommending far-reaching COG "connections" (this is a classified study). We need to do better, carefully phased planning in nuclear-related emergencies and in limited nuclear operations. Mr. McNeese also said that there was a great deal of survival-phase pre-planning already in existence, including standby legal authority at regional, state, and local levels. Mr. Strobe reaffirmed this.

Mr. Edwards of AT&T related that his company has a practical interest in civil defense, because the Bell system is widely distributed over the entire country and has one million employees. These trained "communicators" are a most valuable resource, although the company does not now have the means to protect its people so vital to national survival and reconstitution. A climate of more positive civil defense planning would make corporate emergency planning easier.

Mr. Edwards was asked if there is a separate office at AT&T for civil defense and if they receive Federal funds. The answer was that there is a separate division for emergency planning for corporate survival, and that they receive no Federal funds.

Dr. Dalimil Kybal of FEMA stressed the need to balance offense and defense; the problems of war termination; and he stated a pessimistic view of economic recovery because of lack of plans for the survival and reconstitution phases and the consequent lack of programs and doctrines. He said that recovery was a consequence of these first two phases and should not be forecast in quantitative terms until we had a better idea of how the survival and reconstitution phases could be structured to ensure recovery. For example, attacks on industry could be continued during the reconstitution phases so that the economy never recovers. This, of course, could have a powerful corrosive effect on the allied system as well.

Dr. Kybal concluded by saying that we should try to look at methodologies by which we can achieve the social/political (and military) order that precedes recovery. Many of the participants concurred with the concept of flexible targeting as it contributed to limiting damage to the U.S.: "the only good Soviet cities are live cities, because they keep American cities alive" was one way this concept was stated.

Mr. Divine stressed that more CD programs were not necessary or desirable at this time: what we needed is a plan which this study will help to provide. This was in response to Dr. Eley's criticism that the study lacked programs but, rather, stressed doctrinal requirements.

E. Additional Comments to CD/CEP Workshop

Lt. Colonel Thomas of DNA stated that we need a parallel study of C³ survivability and restorability for COG (civil defense) to match a military study for continuity of Presidential command presently under way. Also, we now know the vulnerabilities of our own C³ program, but we also need to know more about the Soviet vulnerabilities.

General Gray agreed with the basic premise of the workshop that it is a good idea to define terms. He also commented that:

- there is a need for more flexible targeting
- we do not need to cover every "boundary case"
- the Soviet CD program and the U.S. CD program for post-attack recovery are asymmetrical, and this has unique consequences for deterrence
- we must outline minimum Presidential duties during the post-attack survival phase (per the definitions given)
- allied civil defense is very important
- CD is important to ensure war termination (e.g., Presidential successor programs).

Mrs. Greene pointed out that while a public relations plan was needed, this was not the aim of the SRI study. She also agreed with Mr. Foster that we must keep the national will viable and should remain flexible as to whether we have a "top down" or "bottom up" approach. Minimum decentralized doctrinal plans can handle the "bottom up" survival phase; COG plans are needed to handle the "top down" reconstitution phase. Mrs. Greene also stressed the importance of group motivation by shared social and political values.

David Marvil and Harold G. McNeese of FEMA both believed the work being carried out in this study was of great significance in that the SRI study sought to introduce realistic military planning into the CD planning process; such studies could be less "parametric" in the future. This was generally concurred in by Colonel Caruso and Colonel Panier ICAF; Lt. Col. David Thomas, DNA; and Maj. Gen. Triantafellu (USAF, Ret.)

CHARTS

DEFINITIONS OF KEY CONCEPTS

1. SURVIVAL AND RECONSTITUTION

- NOT JUST PHYSICAL.
- MUST INCLUDE SOCIAL COHESION AND POLITICAL PURPOSE.
- MUST INCLUDE MEANS OF CONTROL AND TERMINATION OF WAR.
- PRECONDITIONS OF RECOVERY.

2. CONTINUITY OF GOVERNMENT (COG)

- COG IS THE ESSENTIAL PRECONDITION FOR ACHIEVING SURVIVAL AND RECONSTITUTION.
- COG EMBODIES DEFENSE OF CONSTITUTION AND POLITICAL VALUES, AND CONTINUITY OF SAME.
- MUST INCLUDE PRESIDENT AS COMMANDER IN CHIEF AND HEAD OF STATE AND CHIEF EXECUTIVE,
- MUST INCLUDE CLEAR PRESIDENTIAL SUCCESSOR SURVIVAL SYSTEM TO ENSURE LEGITIMACY.
- RECONSTITUTE CONGRESS AND SUPREME COURT (COULD AFFORD DELAY) TO ENSURE EVENTUAL RETURN TO FULL CONSTITUTIONAL GOVERNMENT.
- MUST EXTEND TO STATE AND LOCAL LEVELS (THE HIGHER THE LEVEL OF WAR DAMAGE, THE MORE IMPORTANT LEADERSHIP AND CONTROL IN "ISLANDS" MAY BE).

DEFINITIONS OF KEY CONCEPTS (Continued)

3. CD / CEP

CIVIL DEFENSE AND CIVIL EMERGENCY PREPAREDNESS INCLUDE ALL PRE-WAR, TRANS-WAR AND POSTWAR NONMILITARY PREPARATIONS--PLANS, PROGRAMS, MOBILIZATION--FOR SURVIVAL, RECONSTITUTION AND RECOVERY

4. RECOVERY

- EVEN AFTER ACHIEVEMENT OF SURVIVAL AND RECONSTITUTION, THE MEANING OF RECOVERY IS NOT CLEAR.
- NEITHER AGGREGATE NOR PER CAPITA GNP AT SOME PREWAR LEVEL APPEARS TO BE A SATISFACTORY MEASURE.
- THE COMPOSITION OF THE GNP WILL CHANGE DRASTICALLY.
- THE WAR, OR AN UNCERTAIN TRUCE, MAY BE LONG.
- THE CRITERIA FOR RECOVERY MUST THEREFORE INCLUDE THE CAPABILITY TO MAINTAIN SUFFICIENT POWER TO ENSURE THE SECURITY OF THE NATION IN THE POSTWAR WORLD.
- RECOVERY MUST BE POLITICAL, SOCIAL AND MILITARY, AS WELL AS ECONOMIC.

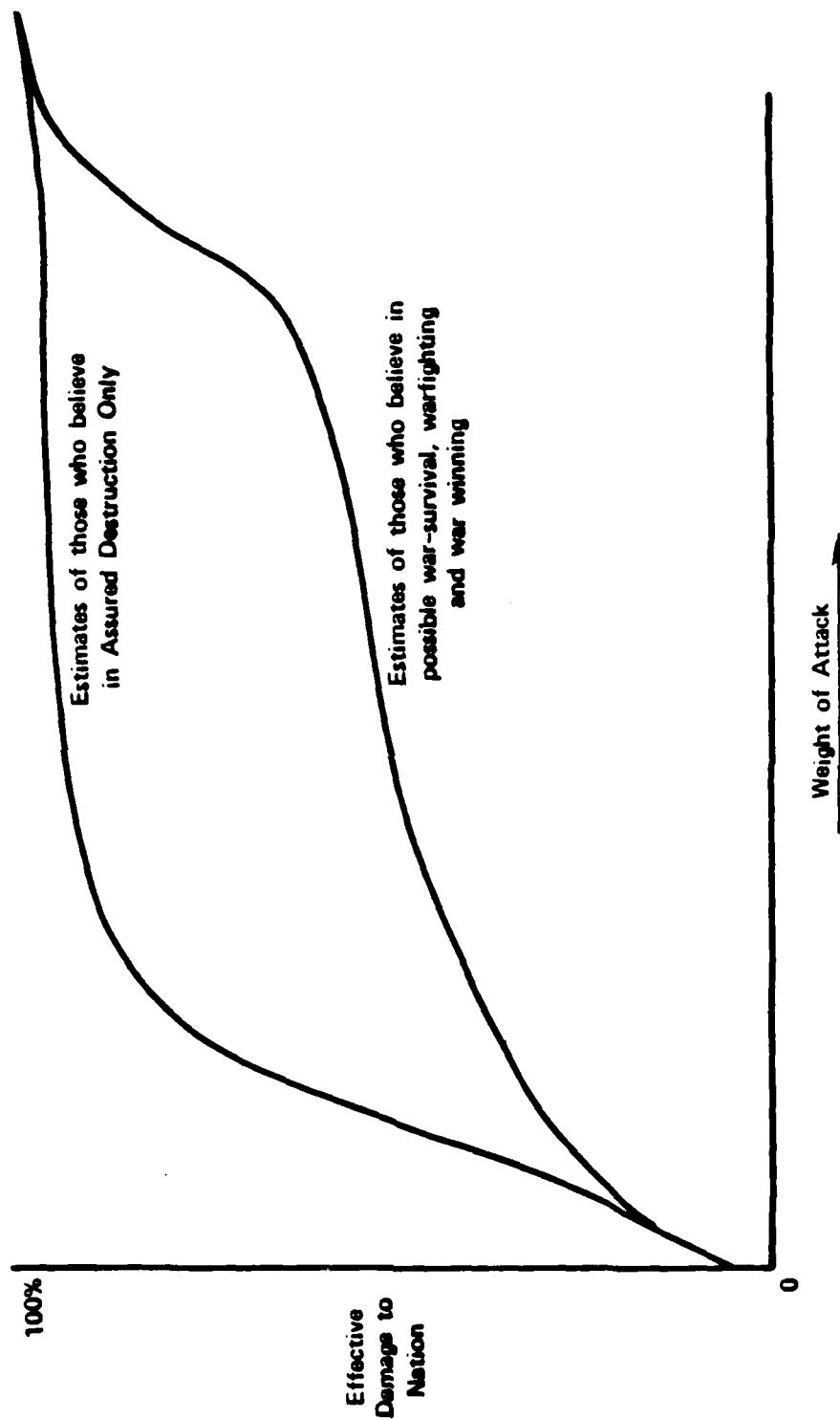


Chart 2 EFFECT OF BELIEFS ON ESTIMATES OF NUCLEAR WAR OUTCOMES

U.S./USSR DETERRENCE CONCEPTS

U. S. GOAL: "DETERRENCE ONLY" AS BASIS FOR DEFENSIVE POLICY

A TOTAL NUCLEAR WAR WOULD RESULT IN:

- ASSURED DESTRUCTION FOR U. S.
- ASSURED DESTRUCTION FOR USSR

U. S. POLICY IS TO CONVINCE USSR OF THE CERTAINTY OF THIS OUTCOME, THUS, CD /CEP HAS A NEGATIVE POLITICAL UTILITY.

USSR GOAL: "VICTORY" AS BASIS FOR INITIATIVE POLICY

A NUCLEAR WAR WOULD RESULT IN:

- ASSURED DESTRUCTION FOR U. S.
- ASSURED SURVIVAL AND RECOVERY FOR USSR

THIS ASYMMETRY COULD RESULT IN MARGINAL SUPERIORITY IN A CRISIS. SOVIET POLICY IS TO CONVINCE U. S. AND ALLIES OF SOVIET ABILITY TO SURVIVE, WIN, AND RECOVER. THUS, CD /CEP HAS A POSITIVE POLITICAL UTILITY.

U.S./USSR ASYMMETRIES IN CONCEPTS OF UTILITY OF NUCLEAR FORCE

THERE IS A BASIC DIVERGENCE BETWEEN U. S. AND SOVIET CONCEPTS OF THE USE OF NUCLEAR FORCE. THERE IS NO FAVORABLE OUTCOME FOR U. S. WITHIN THE CONTEXT OF THESE ASYMMETRIES.

USSR	U. S.
NO CONCEPTUAL DISTINCTION BETWEEN NUCLEAR FORCE CAPABILITIES FOR WAR - FIGHTING AND DETERRENCE; WAR WINNING SEEN AS GOAL, CD/CEP NATURAL PART OF DEFENSE POSTURE	CONCEPTUAL DISTINCTION BETWEEN WAR - FIGHTING AND DETERRENCE; NO CD
EMPHASIS ON COUNTERFORCE TARGETING STRATEGY	DETERRENCE BASED ON MUTUAL ASSURED DESTRUCTION AS ULTIMATE OUTCOME OF NUCLEAR EXCHANGES; WAR TERMINATION UNLIKELY
BELIEF IN THE POLITICAL UTILITY OF STRATEGIC SUPERIORITY	EMPHASIS ON COUNTERVALUE TARGETING STRATEGY (PUNISHMENT /RECOVERY), PARTICULARLY IN TERMS OF DECLARATORY POLICY; BELIEF THAT SOVIET CD CAN BE QUITE EASILY OVERCOME

- Conclusions:
1. There are substantial asymmetries between U. S. and Soviet Doctrine, Force Postures and Deployment, and Operational capabilities, including passive and active defense.
 2. Asymmetries and trends leave no opening for U. S. to pursue a favorable outcome if current U. S. objectives are not changed.

CONSISTENCY OF SOVIET DOCTRINE & FORCE DEVELOPMENT

<u>DOCTRINAL REQUIREMENTS</u>		<u>IN PROCESS</u>
1.	SURVIVABLE RETALIATORY FORCE	LARGE & GROWING, MAJOR EFFORT IN NUCLEAR SUB FLEET
2.	COUNTERFORCE CAPABILITY	ADEQUATE EURASIAN THEATER INTERCONTINENTAL IMPROVEMENTS UNDERWAY
3.	COMMAND-CENTRAL-COMMUNICATIONS	MAJOR EFFORT TO IMPLEMENT "COMBINED ARMS" CONCEPT WITH SURVIVABLE SYSTEMS
4.	CIVIL DEFENSE	EXTENSIVE, WELL ORGANIZED
5.	AIR DEFENSES	CONTINUOUS GROWTH, MAJOR IMPROVEMENTS IN OFFING
6.	NATIONAL ABM	UNDER LARGE SCALE DEVELOPMENT
7.	ASW	UNDERWAY AND INCREASING
8.	BLUE OCEAN NAVY	FORMIDABLE & GROWING
9.	GROUND FORCE & TACTICAL AIR COMBINED ARMS	MODERNIZATION AT RAPID PACE
10.	SPACE	INCREASING ASAT AND OTHER SPACE CAPABILITIES FOR MILITARY RECCE, COMMUNICATIONS, NAVIGATION
<u>DOCTRINAL IMPLICATIONS FOR BUDGETS</u>		
1.	OFFENSE - DEFENSE BALANCE	POSSIBLY ROUGHLY EVEN EXPENDITURES
2.	PRIORITY TO STRATEGIC & TO TACTICAL NUCLEAR FORCES	EVIDENT--TWICE U.S. RATE
3.	QUALITATIVE IMPROVEMENTS	RDT&E EFFORT NOW TWICE U.S.
4.	GROWTH TO BUY "MILITARY- TECHNICAL SUPERIORITY"	RISE OR CONSTANT SHARE OF GNP MILITARY EXPENDITURES RISING AT ABOUT 5% PER YEAR

VECTORS OF POTENTIAL OUTCOMES OF U.S./USSR STRATEGIC NUCLEAR EXCHANGES

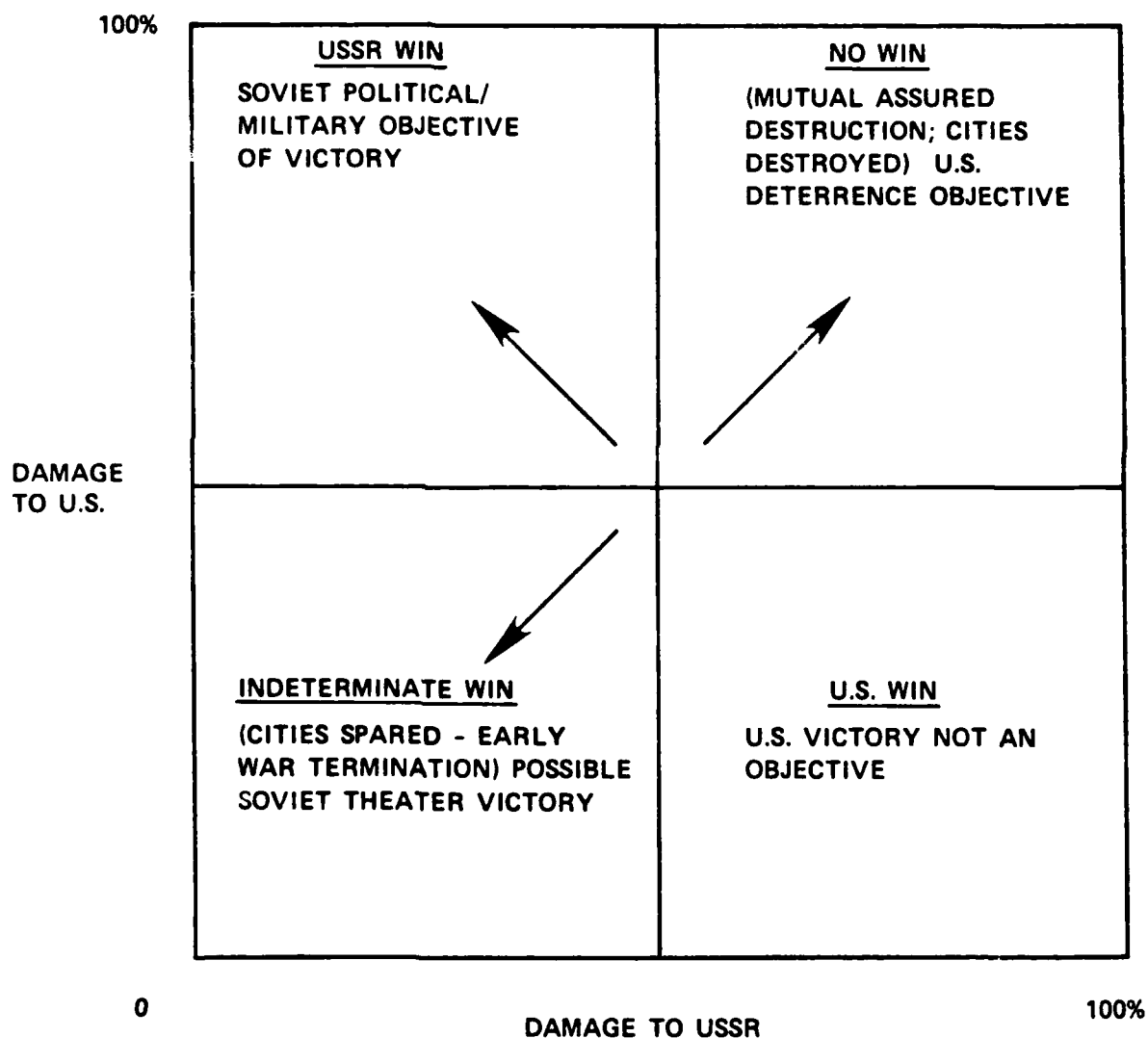
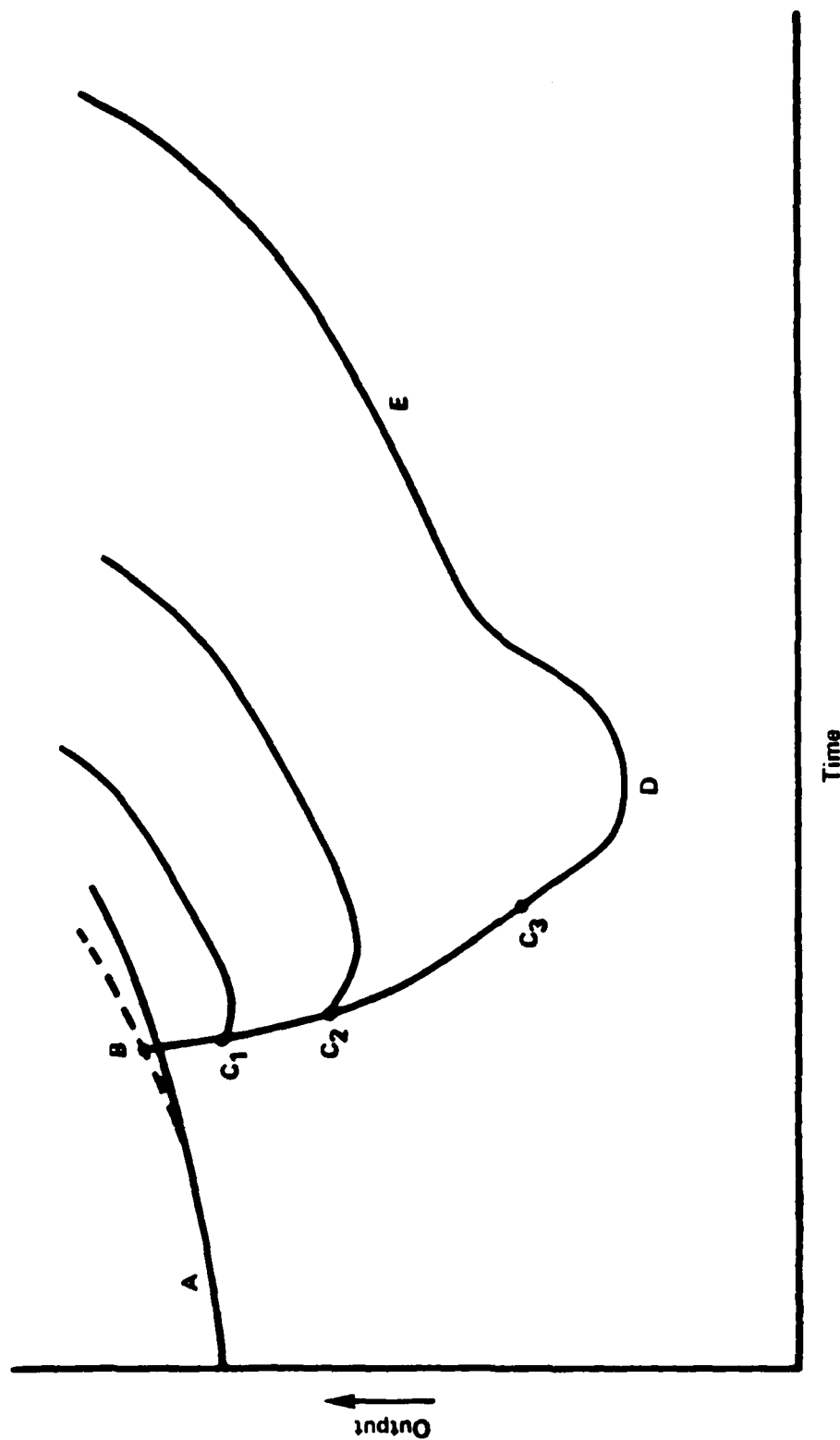


Chart 6

STAGES OF NUCLEAR WAR



A = peacetime economy

B = mobilized economy

C = alternative war termination points

C₁ = Short war: counterforce and collateral damage only

C₂ = Longer war: CF plus defense industry, ports, other military

C₃ = Long war: all-out political, economic and military targeting

D = survival and reconstitution

E = recovery

Chart 7 THE MEASUREMENT PROBLEM: EVALUATING THE ECONOMICS OF SOVIET CIVIL DEFENSE

VIEWS OF VALUE OF CIVIL DEFENSE¹

<u>DETERRENCE</u>	<u>SOVIET VIEWS</u>	<u>U.S. VIEWS</u>
NEGATE OPPONENT'S DETERRENT IN PEACETIME	+	-
CRISIS	+	-
 <u>WAR-FIGHTING</u> ¹		
SHORT WAR	+++	?
LONG WAR	+++	?
LIMITED NUCLEAR WAR	+	?
ESCALATION CONTROL	+	?

111

¹HISTORICALLY, CIVIL DEFENSE HAS BEEN A WARTIME ACTIVITY (INCLUDING IN THE U.S.), AND IS EMBEDDED IN A BROAD CONTEXT OF STOCKPILING, MOBILIZATION OF MILITARY MANPOWER AND THE ECONOMY, CONTINUITY OF GOVERNMENT AND MILITARY COMMAND, AND SUFFICIENT PROTECTION OF POPULATION, INDUSTRY, AND COMMUNICATIONS TO PROVIDE FOR INTRA-WAR SUPPORT TO ALLIES AND POST-WAR RECOVERY.

GOALS OF SOVIET CD/CEP PROGRAMS

THE SOVIETS' CIVIL DEFENSE PROGRAM HAS THREE PRIMARY GOALS:

1. ABILITY TO PROTECT THE CPSU-MILITARY-GOVERNMENT INFRASTRUCTURES AND PEOPLE.
 - A. LEADERSHIP (CONTINUITY OF GOVERNMENT)
 - B. ESSENTIAL WORK FORCE
 - C. REMAINDER OF POPULATION
2. ABILITY TO PROTECT THE SOURCES OF ECONOMIC PRODUCTIVITY; TO ASSURE THE CONTINUITY OF ECONOMIC ACTIVITY IN WARTIME; TO PERMIT THE RESTORATION OF PRODUCTION FOLLOWING A NUCLEAR ATTACK.
3. ABILITY TO SUSTAIN THE SURVIVING POPULATION IN THE PERIOD IMMEDIATELY FOLLOWING A NUCLEAR ATTACK AND TO PREPARE FOR LONGER TERM POSTATTACK RECOVERY.

BASED UPON BEST AVAILABLE INTELLIGENCE AND ANALYSIS, TO WHAT EXTENT ARE THESE GOALS ACHIEVABLE?

SOURCE: CIA DOCUMENT, "SOVIET CIVIL DEFENSE," NI 78-10003, JULY 1978

POLICY OPTIONS FOR U.S. TO OFFSET SOVIET CD/CEP

● THREE ALTERNATIVE PHILOSOPHIES

- DISASTER --"NATURAL EVENT"--NO PREPARATION
- MILITARY PLANNING, CONTROL
- NATIONAL ENTITY SURVIVAL--CIVILIAN CONTROL, PLANNING

● TARGETING CHANGES

- DOCTRINE
- INTELLIGENCE
- FORCE TAILORING

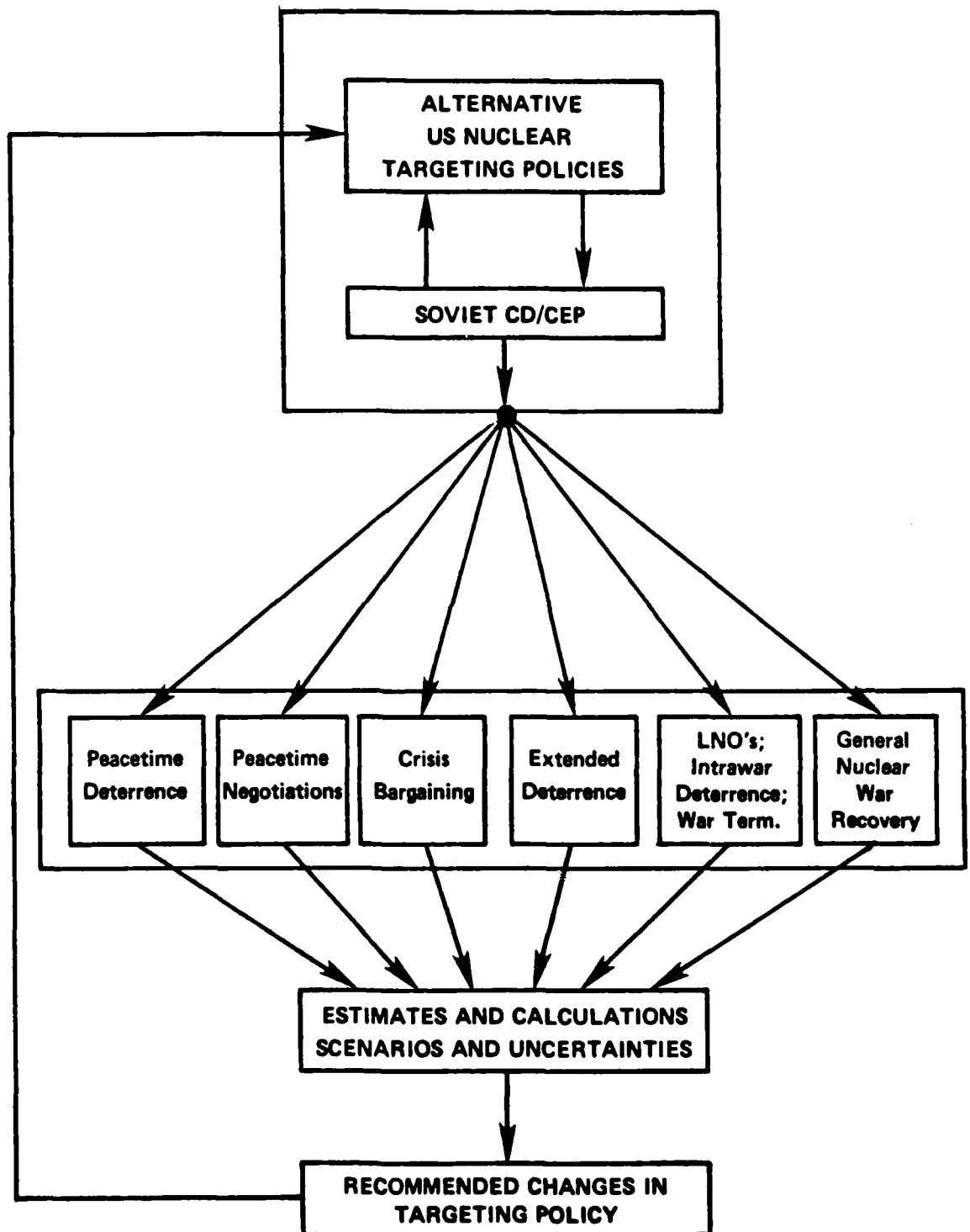
● CD/CEP

- COG
- CD
- CEP--MOBILIZATION AND PREPAREDNESS PLANNING

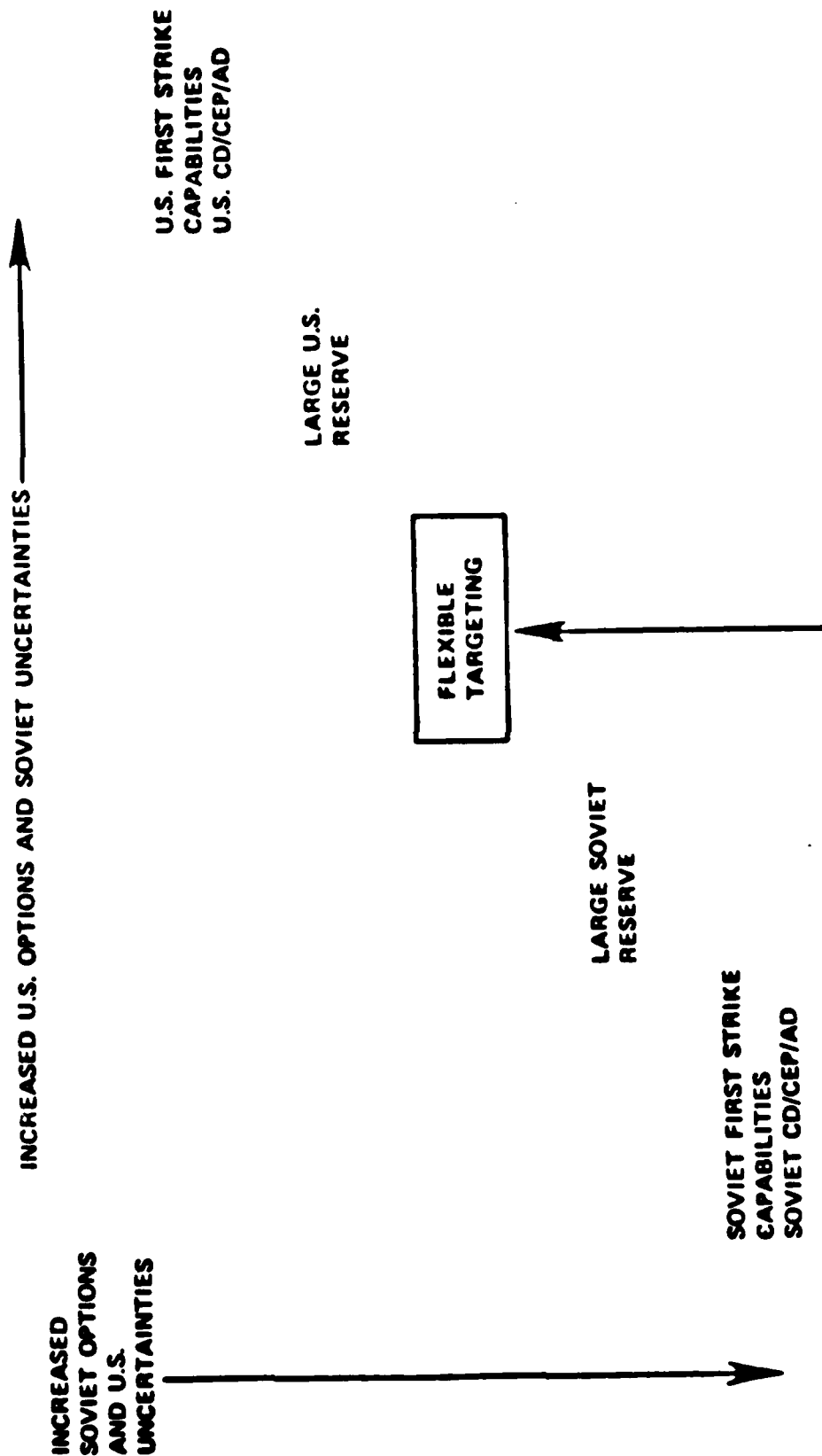
SURVIVAL AND RECONSTITUTION PHASES BETWEEN INITIAL ATTACK AND RECOVERY **THREE PHILOSOPHIES**

PHILOSOPHY	METHOD	OUTCOMES AND OBJECTIVES
<p>A. DISASTER, OR "NATURAL EVENT" Deterrence only: military C³ protected but no endurance; Little COG protection. Little war mobilization capability - or only USSR has it</p>		
<p>B. MILITARY PLANNING ONLY Add: endurance to military C³, some war mobilization and termination capability</p>		
<p>C. NATIONAL ENTITY SURVIVAL Add: COG protection and endurance with civilian control of military at all times; war fighting and termination capability at all levels of attack; CD/CEP</p>		

**METHOD OF INTRODUCING SOVIET CD/CEP FEEDBACK EFFECT
ON U.S. TARGETING POLICY**



IMPACT OF ADDING OPTIONS ON OPPONENT'S UNCERTAINTY OF OUTCOME



HOW MUCH CAN FLEXIBLE TARGETING ALONE OFFSET SOVIET CD/CEP/AD?

**IMPLICATIONS OF SOVIET CD/CEP FOR ALTERNATIVE EMPHASES IN U.S.
NUCLEAR TARGETING POLICY**
(OBJECTIVES FOR EACH OPTION EMPHASIZED)

EFFECT ON:	EMPHASIS ON:			
	POPULATION	RECOVERY	POLITICAL CONTROL	MILITARY POWER
POPULATION	ASSURED DESTRUCTION OF NATION	COLLATERAL	COLLATERAL	COLLATERAL
RECOVERY	SIGNIFICANT	DENY NATIONAL RECOVERY	SELECTIVE	SELECTIVE (MILITARY SUPPORT ONLY)
POLITICAL CONTROL	?	?	DESTROY CENTRAL POLITICAL CONTROL OVER SOVIET REPUBLICS	?
MILITARY POWER	STRATEGIC NUCLEAR TARGETS	WEAKENS LONG TERM SUPPORT	DESTROY MILITARY C ² AND MAJOR WEAPONS AND FORCE CONCENTRATIONS	DEFEAT SOVIET STRATEGIC AND THEATER NUCLEAR AND CONVENTIONAL FORCES
EFFECT OF SOVIET CD/CEP ON U.S. REQUIREMENTS	MORE OFFENSIVE FORCE, BUT SOVIET CD DEFEATS U.S. OBJECTIVE	MORE WEAPONS, LARGER AND MORE ENDURING STRATEGIC RESERVE FORCE (SRF) AND C ³ , BUT CD WEAKENS	PROBABLY THE SAME AS MILITARY POWER REQUIREMENTS, BUT BETTER INTELLIGENCE NEEDED	INCREASED NUMBERS, ACCURACY, FLEXIBILITY OF WEAPONS: C ³ WITH ENDURANCE; SUPPORT OF ALLIED FORCES TO PREVENT SOVIET VICTORY IN THEATERS

U.S. CD/CEP OPTIONS

- ARGUMENTS PARALLEL TO SOVIET CD/CEP ARGUMENTS, BUT
 - ASYMMETRIES
 - IN INTELLIGENCE
 - IN U.S. ACCEPTANCE OF CONSTRAINTS ON OTHER CHOICES
- COG
 - CONTINUITY OF GOVERNMENT MUST ENSURE
 - CIVILIAN CONTROL
 - RECONSTITUTION
 - NATIONAL ENTITY SURVIVAL, INCLUDING RETURN TO CONSTITUTIONAL DEMOCRACY AND VALUE SYSTEM
- CIVIL DEFENSE
 - OF POPULATION
 - OF ECONOMY
 - OF SOCIAL COHESION
- CEP
 - STOCKPILING
 - MOBILIZATION CAPABILITY
 - PLANNING AND PROGRAMS FOR SURVIVAL, RECONSTITUTION AND RECOVERY
 - SUPPORT OF SURVIVORS
 - SUPPORT OF DEFENSE NEEDS
 - SUPPORT OF ECONOMY

SURVIVAL AND RECONSTITUTION PHASES BETWEEN INITIAL ATTACK AND RECOVERY THREE PHILOSOPHIES

PHILOSOPHY	METHOD	OUTCOMES AND OBJECTIVES
A. DISASTER, OR "NATURAL EVENT" Deterrence only: military C ³ protected but no endurance; Little COG protection. Little war mobilization capability - or only USSR has it	Minimum Preplanning Conventional war mobilization only Military command-control nonenduring Ad hoc survival period Military may seek to reconstitute government No war fighting--chaos	Outcomes War over? Clean up the mess? No more enemies? Postwar objectives (not realistic) Domestic - survive, recover Int'l - none, except recover at faster rate than USSR
B. MILITARY PLANNING ONLY Add: endurance to military C ³ , some war mobilization and termination capability	Add: Improved, enduring military C ³ War mobilization, including some stockpiling, etc. Military management of survival period Some short-term war fighting	Outcomes Permanent military control? If war fighting, to what political ends? Postwar objectives: same as A but more realistic
C. NATIONAL ENTITY SURVIVAL Add: COG protection and endurance with civilian control of military at all times; war fighting and termination capability at all levels of attack; CD/CEP pre-war, trans-war, postwar.	Add: Civilian COG planning CD/CEP Mobilization planning and economic allocations to postwar military objectives Civilian control of military for survival aid, war fighting, escalation control, war termination	Outcomes Survival, reconstitution, recovery, postwar power all possible; postwar political ends possible Postwar objectives Domestic: survive, reconstitute constitutional democracy, recover socially, politically, and economically Int'l: a national security position, with allies and access to world's resources and markets, in an international system based on free nations.

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SURVIVAL, RECONSTITUTION AND RECOVERY: U.S.-SOVIET ASYMMETRIES AND U.S. POLICY OPTIONS (Unclassified)
SRI International, February 1980, 146 pages
DCPA01-78-C-0308, W.U. 4341C

A study of the potential contribution of civil defense and emergency preparedness to Survival, Reconstitution and Recovery in the event of nuclear war. Principal findings: (1) the Soviets plan to assure survival and recovery from nuclear war; (2) the widespread U.S. belief that any nuclear war will produce a shock that destroys national cohesion and will, may be self-fulfilling if no preparations are made; (3) the first steps should be education of people as to what can be done and plans to assure government communications to the people during the first phases of a nuclear war; (4) all civil planning must be closely coordinated with military doctrine, forces and C³; (5) Survival and Reconstitution are pre-conditions for Recovery before study of Recovery is relevant.

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